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THE NATIONAL GEOGRAPHIC MAGAZINE

Founders of Virginia

By Sir Evelyn Wrench

With Illustrations by Staff Photographer B. Anthony Stewart

THE founding of Virginia makes an epic story. It is not possible to read of the adventures and sufferings of the pioneers and settlers without a thrill. Among those ordinary folk were many heroes whose names we shall never know, but they played their part in the expansion of the English race across the Atlantic—one of the great dramas of history.*

Surely in this dramatic story of Virginia and its founders the "unknown settler" deserves to have his place of honor. We have the tomb of the Unknown Soldier at Arlington National Cemetery, and in Westminster Abbey, but no monument to the unknown Virginian; yet we cannot overestimate our debt to him.

When we look around the world today and thank God that there are 200,000,000 free men and women all speaking the English tongue, we do well to remember there were fewer than 5,000,000 at the time of the Spanish Armada.

The thousands of our stock who shared that western exodus in the early decades of the 17th century came chiefly from southern England (map, p. 437). Among them were discharged soldiers; farm laborers displaced by the ruinous policy of land enclosures; peasants dissatisfied with their humble lot; younger sons of worthy families; and decent souls who longed to worship God in their own way.

The first steps in the founding of Virginia were taken in the reign of Queen Elizabeth, but in all fairness some share of the credit is due to her grandfather and father.

Henry VII comes into the picture because in his reign John Cabot and his son Sebastian sailed from Bristol in 1497 and traced the northeast coast of North America.

Had the Cabots not made that voyage, there is every likelihood that the ruling tongue in Virginia today might be Spanish instead of English.

Henry VII was as miserly as his burly son was prodigal. This is why he spent but £300 on colonial enterprises. When Bartholomew Columbus sought to arouse the monarch's interest in his brother's scheme, his mission failed because, he was told, there was "no present profit in the enterprise".

Cabots Left Few Records

When Cabot had his interview with Henry VII, the monarch had grown wiser; he had, of course, heard of the Columbus journeyings, and he must have rued his refusal to Bartholomew Columbus. He now gave permission to "our well-beloved John Cabot" to sail uncharted seas, but with an eye on the main chance he demanded one-fifth of the profits.

If the Cabots have not been tendered their rightful place in the annals of discovery, this is doubtless due to the fact that they left no proper records, as did Columbus. Much of our scanty knowledge of the subject in its early stages comes through letters from Italians resident in London.

Lorenzo Pasqualigo, writing in August of 1497, after the first voyage, tells us how Henry VII had promised Cabot ten ships for the next spring.

* See, in the National Geographic Magazine: "Tidewater Virginia, Where History Lives," May, 1942, and "Potomac, River of Destiny," July, 1945, both by Albert W. Atwood; "Approaching Washington by Tidewater Potomac," by Paul Wilstach, March, 1930; and "Restoration of Colonial Williamsburg," by W. A. R. Goodwin, April, 1937.

Tower of London "Beefeaters" Tread the Walk Where the Imprisoned Raleigh Exercised

As a captive in Bloody Tower (left), Sir Walter Raleigh wrote his *History of the World*. Since the wall on the right did not then exist, sailors on the Thames could see him pacing back and forth (page 437). As this is a holiday, the yeomen warders wear their scarlet state dress, dating from the time of Henry VII or Edward VI. In the distance is a part of Tower Bridge, which spans the river.

The letter adds that the King had given him "money with which to amuse himself till then, and he is now in Bristol with his sons and wife . . . vast honour is paid him; he dresses in silk and these English run after him like mad, so that he can enlist as many of them as he pleases."

Nevertheless, the reception accorded to Cabot on his return was very different from the wonderful welcome given to Columbus by Ferdinand and Isabella at Barcelona. There is a terse entry in the Privy Purse account recording the gift of £10 "to hym that founde the new isle," and the fact that he also received a pension of £20 a year, which he did not live long to draw.

When Spain's claim to world domination had to be challenged, Elizabeth was ready, in no small degree because of her father's interest in naval matters and coast defense. Henry VIII and his minister had built the dockyards of Woolwich and enlarged those of Deptford on the Thames (both now in metropolitan London) and built forts on the south coast; he had founded Trinity House in London as a school for pilots, and popularized everything to do with the sea.

There is an entertaining account from the

pen of the French envoy of the launching of the *Princess Mary*. He was an eyewitness, and we learn that Henry VIII "acted as pilot and wore a sailor's coat and trousers made of cloth of gold, and a gold chain with the inscription 'Dieu et mon droit,' to which was suspended a whistle which he blew nearly as loud as a trumpet."

A number of circumstances had been conspiring to identify the Virgin Queen with North American colonization. During her reign we can watch the beginnings of one of the most exciting periods in the history of the English-speaking peoples; all England was looking westward. The harbors of the south had caught the prevailing "Spanish fever"; younger sons out for adventure, sea dogs, explorers, pirates, and traders yearned to join in the crusade against Spain.

The Elizabethan age ought to have witnessed the settlement of Virginia. It might have done so had Raleigh's expeditions settled on the Chesapeake and not Albemarle Sound.* By their failure the colonization of North America by England was delayed till the reign of King James I. Nevertheless, "to Raleigh belongs the credit of having, first of Englishmen, pointed out the way to the formation of a greater England beyond the sea."

Drake's Potatoes and Raleigh's Tobacco

In the popular mind Drake and Raleigh are usually regarded as the introducers of potatoes and tobacco into England. I remember as a boy suddenly coming upon a statue of Drake, "the discoverer of the potato," in the little town of Offenburg in southern Germany. These "rare plants" were certainly growing in Lord Burghley's garden in the Strand, London, in 1596.

Raleigh was apparently "the first Englishman of rank to smoke." I wonder how many of the smokers of Virginia tobacco today realize with what disfavor the seductive weed was regarded in the heroic age of Virginian exploration.

Both James I and Sir Edwin Sandys, the champion of Virginian rights, shared an utter dislike for it, although the latter recognized its importance as a valuable export from the young colony.

Sandys referred to tobacco as a "deceivable weed" which "served neither necessity nor for ornament to the life of man, but was founded only upon an humour which might soone vanish into smoake and come to nothing."

In a debate during the reign of James I a Member of Parliament stated that "tobacco hindereth all the kingdom in health and otherwise"; another worthy Member wanted "to pull it out by the roots"; while Sir J. Horsey thought "not to speak of this vile weed," and added when he was first a Parliament man "this vile weed was not known."

Hakluyt's Part in the Birth of Virginia

Richard Hakluyt is only gradually coming into his own as one of the prime movers in the settlement of Virginia. Although he never crossed the Atlantic, his was the mind behind most of the colonization projects, and his was the pen that preserved for posterity the records of that wonderful age.

Hakluyt was educated at Westminster School, within the shadow of the Abbey, a seat of learning patronized by the sons of wealthy Virginians and Carolinians in the 18th century (Plate IX). While at school he saw a map depicting recent discoveries, and the Psalmist's account of "the wonders in the deep" became a living reality to him. And he fell under the spell of Humphrey Gilbert, who was to "settle" Newfoundland.

In the hundred years prior to his birth most of the great voyages of discovery had taken place. Bartholomew Diaz had rounded the Cape of Good Hope, Vasco da Gama had reached India,† Columbus had explored the Caribbean, and the Cabots had sailed along the northeast coast of North America.

His object was to preserve for future generations the records of the part Englishmen were playing in exploration, and above all to convince his countrymen that their true interest lay in oceanic trade and colonization.

While at Oxford—he was at Christ Church—Hakluyt tells us he read "whatsoever printed or written discoveries and voyages I found extant . . ." While serving as chaplain to the English Ambassador in Paris, he continued his studies of Portuguese, Spanish, and French exploration, and made "diligent enquiry of such things as might yield any light unto our western discovery of America."

An Early Ship News Reporter

At the age of 30 he published *Divers Voyages Touching the Discoverie of America*. He was appointed to a prebendal stall at Bristol Cathedral, and in no place could he have been more at home, because the West Country was

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Bit of Elizabethan England in America," by Blanch Nettleton Epler, December, 1935; "Motor-Coaching Through North Carolina," by Melville Chater, May, 1926; "Tuftedia on Parade," by Leonard C. Roy, August, 1941; and "Exploring America's Great Sand Barrier Reef," by Eugene R. Guild, September, 1937.

† See "Pathfinder of the East," by J. R. Hildebrand, November, 1937.

Elizabeth as She Looked at the Age of 53

This London monument, standing over the vestry door of St. Dunstan-in-the-West, is one of the two statues of the Queen which are believed to have been made during her lifetime. St. Dunstan, mentioned as early as 1237, escaped the Great Fire of 1666 by a few yards.

humming with the exploits of the seamen just back from the Spanish Main.

Hakluyt could almost sniff the tang of the Bristol Channel from his study. When his religious duties permitted, he had but to stroll to the near-by quay to check his information at first hand. He was a careful historian; once he rode to the Norfolk coast to obtain information from the survivor of an expedition.

In 1587 he wrote to Raleigh, encouraging him to persevere in his Virginia enterprise: "I can see great comfort of the success of your action, hoping that the Lord, Whose power is wont to be perfected in such weakness, will bless the foundations of this your building. Only be you of valiant courage and faint not, as the Lord said unto Joshua exhorting him to proceed on forward in the conquest of the Land of Promise."

While Hakluyt was busy with what Froude calls "the great prose epic of the modern English nation," Michael Drayton, the poet, thus referred to the plantation of Virginia by the Queen:

> Who sent her navies hence
> Unto the either Inde and to that shore so green,
> Virginia, which we call of her a Virgin Queen.

Hakluyt, now a prebendary of Westminster, was among those who petitioned King James for the Virginia Charter in 1606; as a member of the Virginia Company he followed closely the stirring events of the next decade and witnessed the realization of some of his hopes. He is buried in the Poets' Corner of Westminster Abbey, and there is a tablet to his memory in Bristol Cathedral.

Raleigh must be reckoned as an Elizabethan, for his endeavors to settle "Virginia" took place before King James came to the throne. There are associations with Raleigh in many places in southern England, and above all in Devon. He was essentially a man of Devon and spoke with a Devonshire accent all his days.*

He was born at Hayes Barton farmhouse, thatched and three-gabled, near East Budleigh, ten miles from Exeter in the vale of the River Otter (Plate II); there he must often have talked with sailors back from the sea; Millais' familiar picture, "The Boyhood of Raleigh," was painted in Budleigh Salterton rectory.

* See "Down Devon Lanes," by Herbert Corey, National Geographic Magazine, May, 1929.

England, Mother of Virginia, Is Dotted with Shrines Venerated by Americans

In front of Hayes Barton farmhouse is an Old World garden. In the kitchen we found a crescent-shaped settee, dating from Raleigh's time, facing the open hearth.

Upstairs is the four-poster in which it is believed he was born, and "Raleigh's little smoking room." In various places the visitor is shown the spot where Raleigh is supposed to have had his first smoke!

In All Saints' Church, East Budleigh, "the mother church of the district," near Hayes Barton, we can see the Raleigh family pews, and on one of them the family arms are carved.

In our school days we read of Raleigh's gallantry to the Queen. It was not in Devon, however, that he put down his cloak for Elizabeth to walk on, but more likely near Canonbury Tower in north London. One of the tragedies of his life was that, while he schemed and poured out his wealth to found an empire overseas, he was never to visit Virginia.

"For several years Raleigh belonged to the Court, the recipient of the Queen's bounties to an extent which gave much occasion for scandal," but trouble was near. He committed the serious crime, from the Queen's point of view, of falling in love with one of her maids of honor, Elizabeth Throgmorton.

Victim of a Jealous Queen

The Queen never did things by halves. When she heard of the romance, she had Raleigh and the young lady locked up in the Tower of London. It is curious that the marriage should have begun and ended there.

Subsequently they were released and settled down at Sherborne Castle, now in ruins.

Near by is the house which Raleigh started to build but never lived in. During World War II it served as an American hospital, and in the autumn of 1946 I observed American personnel in a jeep careering along the Dorset lanes which Raleigh knew.

During Queen Elizabeth's later years Raleigh was restored to favor. We read that he was in daily attendance at Court in 1597. "In the evening he rid abroad with the Queen and had private conference with her."

With her death, however, hard times lay ahead; King James confined him for a dozen

In St. Ethelburga's, Henry Hudson Took Communion Before His First Voyage of Discovery

Dating from 1390, the church stands on Bishopsgate in the London financial district. It has defied time, wreckers, Great Fire, and blitz. Three stained-glass windows commemorate Hudson's voyages.

years in the Tower of London, whither his wife repaired to join him and where one of his sons was born.

Raleigh's last two years were dogged with misfortune. He obtained a release by subterfuge in 1616 and set out on a last expedition to Guiana, again in search of El Dorado.

After a series of disasters he returned to Plymouth, in June, 1618, and here his wife rejoined him with terror in her heart. How she must have wished that he had remained at the Tower of London, completing his *History of the World*, instead of embarking on a barren expedition with almost inevitable punishment ahead (page 434).

The mystery of his burial place will probably never be solved. He was executed on October 29, 1618, in Palace Yard, Westminster, and his body undoubtedly lay for some hours in St. Margaret's Church. This claims to be his burial place (Plate V), and there, incidentally, is a window to his memory erected in 1882 by American admirers.

There are, however, other factors to be considered. Beddington Church, in Surrey, situated in an oasis of the Old World that has escaped the engulfing tide of modern suburbia, also claims to be his resting place. The church that existed in Raleigh's time is still there, and the home of the Carew family. Raleigh's mother-in-law was a Carew.

The red-brick wall still stands that may have sheltered the first oranges grown in England. Local legend has it that they were planted from seed Raleigh obtained from Florida; the trees survived for 140 years but succumbed to the hard frost of 1739. I am told the original iron gates of the house are now in Virginia.

A Letter from Elizabeth Raleigh

After the decapitation of her husband Elizabeth Raleigh wrote to her brother: "I desire, good Brother, that you will be pleased to let me bury the worthy body of my noble husband, Sir Walter Raleigh, in your Church at Beddington, where I desire to be buried. The lords have given me his dead body though they denied me his life. This night he shall be brought to you with two or three of my men. God hold me in my wits."

It is not surprising, in view of this letter, that Beddington claims to be regarded as the resting place of Raleigh. The sorrowing widow would certainly have wanted to bury the body in some place associated with happy days and as far as possible from the scene of execution. If the body is here, it must be in the Carew vault, which was filled up with concrete half a century ago.

Anyhow, no more poignant picture of the days of King James comes down to us than that of poor Elizabeth, bearing with her all her days her husband's embalmed head in a red-leather bag.

West Horsley Place, also in Surrey, was inherited by Raleigh's younger son, Carew. The son buried his father's head in the local church, having received it from his mother on her death.

Sandys Helped Pilgrim Fathers, Too

I sometimes wonder why the story of the founding of Virginia has not received as much attention as the sailing of the Pilgrim Fathers. There would have been no *Mayflower* had there been no Virginian settlement; Sir Edwin Sandys, leading champion of freedom in the Virginia Company, was also connected with the voyage of the Pilgrim Fathers (Plate V).

When the exiles in Holland decided that they wanted "to live as a distincte body by them selves under the generall government of Virginia," it was to Sandys that Robert Cushman and John Carver came in 1617.

Sandys encouraged them in their project, and thanks to his help the Virginia Company was well disposed to them. In November that year Sandys wrote to the Reverend John Robinson, and to his old friend, Elder William Brewster, whom he had known since Scrooby days, encouraging the exiles in their undertaking.

American historians have done much in recent years to help us arrive at a fairer appreciation of the work of the men who sponsored the Virginian settlement in its early days, and we certainly owe them a debt of gratitude. I can never read the records of the Virginia Company without being deeply stirred. There is an entire lack of formality about its proceedings. It is almost as though we were in the friendly atmosphere of a family concern.

Of Christopher Newport, who piloted the expedition that founded Jamestown, little is known beyond the fact that he was a skilled navigator and made the journey to the colony five times. There is a reference to one stormy scene at the Company's deliberations, when, in a moment of tension, Sir Thomas Dale, the early Governor who brought back John Rolfe and Pocahontas with him, pulled the beard of Christopher and threatened to hang him! Anyhow, Dale certainly never carried out his threat, because Newport died in the East Indies.

To our modern way of thinking, it seems incredible that the Company never, apparently, had an office building of its own.

The members usually met in the London house of one of the leading adventurers; in Philpott Lane, where Sir Thomas Smith resided; in the house of Sandys in Aldersgate, and even, after the death of Nicholas Ferrar, Senior, in the parlor of his widow in Sythe Lane; or in the house of Henry Wriothesley (third Earl of Southampton) at Southampton House, Holborn.

The members of the Virginia Company concerned themselves with every manner of problem connected with colonization, and almost of necessity mistakes were made.

The doctrine was widely held that a colony was a place where the mother country's unwanted population could be dumped; too little attention was paid to the selection of the human material at the outset. Many misfits were sent across the ocean at first, but wiser counsels soon prevailed.

Capt. John Smith and others urged the need of sending men who could work with their hands. The Board soon took up this matter energetically, and on my desk lies a list of the settlers sent across the ocean in 1610. There were farm laborers, swineherds, millwrights, gunmakers, brewers, bakers, distillers of aqua vitae, hatmakers, apothecaries, ship carpenters, tinkers, tailors, bricklayers, biscuitmakers, bellowsmakers, fishermen, husbandmen, gardeners, and so on—all sound workers, and just the material urgently needed by a new country.

Ten years later, while Sandys was governor of the Company, it sent many ironworkers from Warwickshire, Staffordshire, and Sussex to help in the creation of the iron industry. Sandys held that there was "no better iron in the world" than the Virginia product.

"A New and Better England"

No body of men, not even the colonists themselves—called the "venturers," as distinct from the "adventurers," who remained at home—had the welfare of Virginia more at heart than the Company's liberal group. For the most part, they were not thinking of colonization in terms of immediate profit; they were inspired by the vision of a commonwealth across the seas where a new and better England would be created, and where the individual rights of the settler would be safeguarded.

Their purpose was nearly frustrated by James I, but the goddess of destiny stepped in. No sooner had the Company been dissolved than James I died; and luckily his successor, Charles I, was well disposed to several members of the liberal group.

The political rights which Sandys had won for the colony were allowed to stand; and an American historian has written that Jefferson's dream of human liberty was based on the ideals so dear to Edwin Sandys. Sandys and his friends must have discussed the fundamentals of democracy in the parlor of Mrs. Nicholas Ferrar, and in the homes of Sandys and Southampton with Francis Bacon, and, in all probability, with Shakespeare.

The meetings of the Company were by no means confined to matters of high policy, for there was the ordinary humdrum work of a colony more than 3,000 miles away to be dealt with. The settlers needed livestock; and shipments of cattle, horses, and swine were dispatched. We read that £10 per head was the fee paid to the shipper for each cow landed in good condition.

The acute shortage of women in Virginia was one of the main problems. In a note accompanying "one widdow and eleven maids for the people of Virginia," detailed instructions were sent to John Pountis, one of the Company's local officials, in these terms: "Most especially we recommend to you, Mr. Pountis, that at their first landinge they may be housed, lodged, and provided for of diet till they be marryed, for such was the haste of sending them away, as that straightened with time, we had no meanes to putt provisions aboard."

On one occasion the good vessel *Tiger* conveyed "fifty maydes" to Virginia, and the reception official (I wonder if he was our friend, Mr. Pountis?) was shouldered with the responsibility of "providing for them at their first landing and disposing of them in marriage (which is our chiefe intent); we leave to your care and wisdom."

Poor Mr. Pountis must have had his hands full; he combined the functions of a modern representative of the Ministry of Food, a matrimonial agent, and a billeting officer in one! Fortunately, there was variety in his job; if intending wives began to pall, there was other living cargo to be dealt with.

The vessel *Discoverie* was evidently a floating farm and menagerie, for it bore from England "divers sorts of seeds and fruit-trees as well as pidgeons, conies, peacocks, mastiffs, and beehives." I wonder who were the recipients of the peacocks!

Difficult times for the Company were now ahead. King James, egged on by the Spanish Ambassador, Gondomar, was jealous of its activities. The result of the machinations of the Crown party was the canceling of the Company's charter in 1624.

Fortunately, Sandys and his friends anticipated this move of their opponents; and when

Ektachrome by R. Arthur Stewart

Like Sir Walter Raleigh of Virginia Fame, This Bobby Speaks with a Devon Accent

Clifford Jones, clasping daughter Dianne, represents the Devon Constabulary in Chagford. He carries no firearms except in emergencies. As a policeman during the blitz, he won the Defence Medal (ribbon).

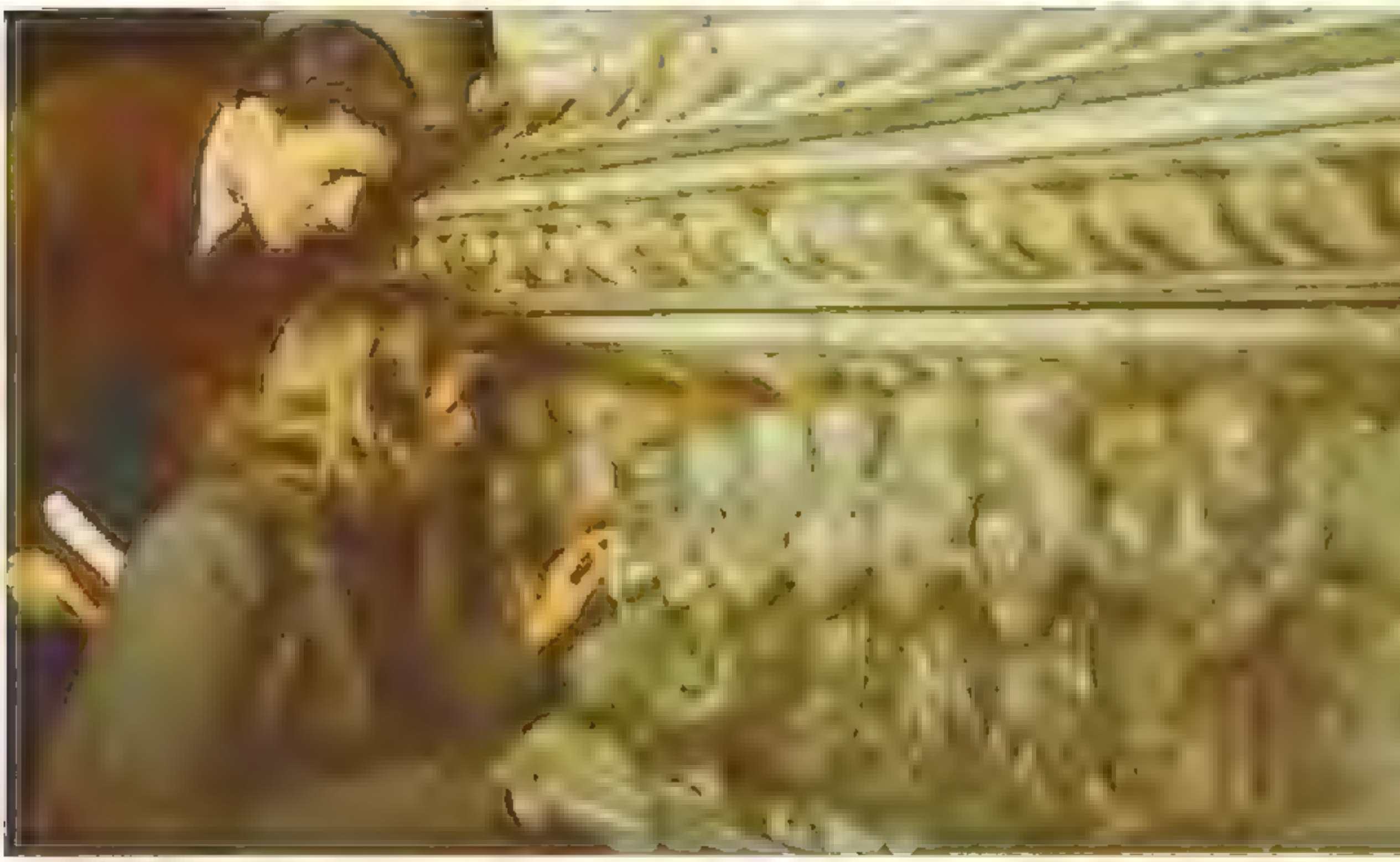
Devon Men Say Raleigh Smoked His First Pipe of Virginia Tobacco in This Thatched House. His Birthplace near East Budleigh

Elizabeth, for When a Virgiuess Is Needed, Is Shown in Wax

[illegible]

Capt. John Smith Is Overpowered by the Pottowatomie Squaws From Which He Ran Away

Lord Lyndale Observes Claire Rolandi's Beheaded Body. This Photo Becomes a Mystery.



Sir Edwin Sandys, a Virginia Founder, Is Pictured on a Tourist Trial from Hell

Children Share Their Sweets Ration with Prince Peggong on the Wedding of Lyadi Prince. Other Boy Carriages Must Detour

Britain's Children Were Never Healthier, Gossamps Make the Sweetness

Love of Horses Shines in This Boy's Face

In Gathered Straw Hats, Fred's Costumes Draw for Action on the Theater

[illegible]

Hartenbach Roses Tie Up Jewels of Duchess of Gloucester III, Fred's Friend

[illegible]

Where Colonial Students Studied: Jesuits' Westminster School in the Heart of London

In Searchlight on Aswan
Lured the Cretons a
Rue Vacation Days

Mean Is as Sweet as Flowers Are Planted at the Duchess's in Sussex

Lovely Sight: Daisy Rolling Down a Bank

Tourists Gulls Gross Beak and Sacks at Cossely, Scotland Across Atlantic Gulls to Heaven

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The Family Car Lacks Petrol, But What Comes of That? Here's a Bicycle Built for Three!

Soldiers of the Field—Struggling for Food, Are Heroines of England's Land Army

When Canoe Have Left, So Plenty Oatmeasers' — **Their Paddles Almost Shoulder to Shoulder, Line the Withom's Banks**

[illegible]

To a Returning Englishman, No Sight on Earth Can Equal the White Cliffs of Dover: St. Margaret's Bay, Kent

A Family of Pastoral Tastes — Recently Study and Its Discussions — Earlier Interest

Your Austerity Need Not Invade the Farm — This Family Can Grow Much of What It Needs

the royal commissioners took possession of the official records, the liberal party had already taken steps to preserve copies of the Minutes during these vital years.

The preservation of these records has thrown much light on the early proceedings of the Company, and, above all, on the struggle made by Edwin Sandys to establish a settlement of a "free popular state" in the New World, where the English settlers would have "no government put upon them but by their own consents."

The Saving of the Records

The story of the saving of the records begins with Nicholas Ferrar. At a cost of £50 to himself, he had an exact copy of the Minutes made. Each folio was compared with the original and initialed by the secretary of the Company, and Ferrar then took the volumes to Lord Southampton.

So delighted was the latter that he threw his arms around Ferrar and said: "Let them be kept at my house at Titchfield. They are evidences of my honour, and I value them more than the evidences of land."

William Byrd, of Virginia, bought the documents from the executors of Southampton's son half a century later; they came that way to Jefferson's library, and after his death to the Library of Congress, where they now rest and are referred to by Alexander C. Brown, American writer, as "the most precious volumes preserved in the Republic."

Southampton flits across the stage in the reigns of both Elizabeth and James. Literature was his chief interest, and he is best known as the patron of Shakespeare, who dedicated to him his early poems. He shared with Raleigh the experience of becoming enamored of one of the Queen's waiting women, also an Elizabeth.

When the Queen heard of her young attendant's love affair, she bundled her and Southampton into London's famous Fleet Prison for a time, and he was never restored to the Queen's favor.

When James came to the throne, one of his first acts was to release Southampton from the Tower, where he had been imprisoned, this time for treason.

By reason of his influential connections Southampton was to prove a useful friend to Virginia, and henceforth he devoted his energies and wealth to colonial enterprises. He equipped an expedition to Virginia and helped to expedite a voyage of Henry Hudson in his search for the Northwest Passage.

The last years of his life were intimately connected with Virginia, for he succeeded Edwin Sandys as governor (treasurer) of the Company, a position which he occupied for four years, till the canceling of the charter. Before the end of the year both he and his son died fighting in Holland.

They are buried in Titchfield Church, which has safely survived the war, even though it is in the neighborhood of Southampton.*

Another liberal member of the Virginia Company, Sir John Danvers, must have been an attractive young man. A contemporary described him as possessing "in a fair body as harmonious a mind," and a fellow traveler relates that when in Europe "the people would come out into the street to admire him."

His chief hobbies, apart from his interest in Virginia, appear to have been laying out gardens and architecture. He had a curious link with George Herbert, the poet, well-wisher of Virginia, and with John Donne, the Dean of St. Paul's, who preached a well-known sermon about the Virginian settlement.

Danvers, when little more than 20 years old, married George Herbert's mother, who was twice his age. Magdalen Danvers must have been a woman of great charm, for Donne wrote of her:

> No spring nor summer beauty hath such grace,
> As I have seen in one autumnal face.

Lady Danvers was certainly a remarkable woman to have made a success of such a marriage. Donne is our authority, and he tells us that he saw much of their married life and that they lived happily till Magdalen's death; the partnership had lasted 19 years.

A "Pure Maid, Chaste Wife, True Widow"

Edwin Sandys' father, the Archbishop of York, was born at Hawkshead, close to Windermere.

In Hawkshead School the Archbishop's family Bible is preserved, with the entry of the birth of his second and famous son, on December 9: "At six of the clock in the morning of the year of our Lord God 1561" (at Hartlebury Castle, Worcestershire, which has been in tenure of the See of Worcester for more than 1,000 years).

The Archbishop is buried at Southwell Minster, and his wife is buried at Woodham Ferrers, Essex. "She lived a pure maid twenty-four yeares, a chaste and loving wife twenty nine yeares, a true widow twenty-two yeares to her best."

* See in the NATIONAL GEOGRAPHIC MAGAZINE: "Henry Hudson, Magnificent Failure," by Frederick G. Vosburgh, April 1940; "Southampton—Gateway to London," by Stanley Toogood, January 1941, and "A Modern Pilgrim's Map of the British Isles," issued as a supplement, June 1937.

Edwin Sandys was a student at Corpus Christi, Oxford, where his tutor was Richard Hooker, but a few years his senior. Hooker was undoubtedly largely responsible for inculcating in him the love of freedom. In 1599 Sandys wrote *Europæ speculum*, a work of great toleration to every religious sect.

Sandys was highly respected in Parliament and, with possibly the exception of Francis Bacon, also deeply interested in Virginia, no man enjoyed the confidence of the Commons to a greater degree.

One of Sandys' best-remembered speeches was delivered in the reign of James I, and could not have added to his popularity with the monarch. With views, as usual, much in advance of his time, he maintained that "the origin of every monarchy was in election; that the people gave its consent to the King's authority, on the express understanding that there were certain reciprocal conditions, which neither King nor people could violate with impunity; and that a King who pretended to rule by any other title, such as that of conquest, might be dethroned whenever there was force sufficient to dethrone him."

Sandys, having spent much of his later life in Kent, was buried in Northbourne Church a couple of miles from Deal, and despite Nazi bombing of this portion of "Hell Fire Corner," it has escaped devastation.

For a time Sandys was a Member of Parliament for Sandwich, the picturesque and ancient port probably best known to Americans as the scene of international golf championships.

Sandys was married four times, and by his fourth wife he had seven sons and five daughters. Just when his struggle for Virginian freedom was at its height, he was in constant anxiety about his wife's health. As a matter of fact, she outlived her husband by eleven years.

One of the closest friends of Sandys was Nicholas Ferrar, who stood by him and Southampton in their struggle with the Crown.

A Bequest for "Higher Learning"

Nicholas loved Virginia, although he never visited the country; he worked for its welfare during six strenuous years when he and his brother John were actively engaged in its management. The religious aspect of colonization made a deep appeal to him, and he longed to go with George Thorpe to convert the heathen. He also wanted to translate the New Testament "into the language of the savages on the Virginia Plantation."

Nicholas was educated at Enborne near Newbury, in Berkshire, and at the age of 14 went to Clare College, Cambridge. His father, also Nicholas, was a leading Merchant Adventurer in the City of London and had been interested in the voyages of Hawkins, Drake, and Raleigh; so young Nicholas was brought up in an atmosphere of exploration.

He was just 18 when the expedition which founded Jamestown sailed from the Thames.

His father was the first man to leap with a sum of money for "an American institution of higher learning"; he left the sum of £500 towards the cost of educating "minded children" at the college to be established in Virginia.

His mother was a woman of deep piety, and it was undoubtedly from her that he inherited his burning faith and the desire to consecrate himself to the spiritual life.

When the battle for the Virginia Company was lost, Nicholas Ferrar decided to withdraw from the rough-and-tumble of ordinary life and devote himself entirely to prayer and meditation. Who can say how much we owe to the prayers and example of that little community of between 30 and 40 souls that he and his mother set up at Little Gidding, in Huntingdonshire?

A Patch of Unspoiled England

Little Gidding is not too easy to find. On the way thither we asked a farmer for directions and inquired apprehensively if the church had suffered from German bombs.

He soon set our fears at rest and laughingly replied: "You're not the first, by a long way, and won't be the last, who've not been able to find Little Gidding. Neither could Hitler!" In a neighboring field we noted some German prisoners hard at work.

My two visits to Little Gidding stand out as red-letter occasions. The church, one of the smallest in England, situated on a hillside near some farm buildings, looks out, as it did in Ferrar's day, on gracious uplands golden with buttercups and with larks gambolling in the sunshine. If I were asked to show a visitor a bit of unspoiled England after this second World War, I would take him to Little Gidding.

The buildings in which the community lived no longer exist, but the little church still stands and is lovingly tended. (page 462) The door is left open; the visitor can wander about at will. In front of the church door are the tombs of the two brothers, Nicholas and John; over the porch are the words, "This is none other but the House of God and Gate of Heaven."

Although Nicholas and John Ferrar were no longer responsible for the affairs of Vir-

Lands End: Americans' First and Last Sight of England, Many Visitors with Ties

This spot, where the Cornwall peninsula juts into the Atlantic, [illegible] west. Here many an American-bound settler got his last glimpse of the [illegible]

kind. They constantly held the colony in their prayers. Nicholas, who had pledged himself to celibacy, was ordained deacon in his thirty-fifth year by Archbishop Laud in Henry VII's Chapel on Whitsunday, [illegible]

John Ferrar became the proud father of a little daughter on the first Christmas Eve at Little Gidding. [illegible] relates that she was named Virginia, "out of their affection to the remembrance of the [illegible] Virginia which they so dearly affected, and that John Ferrar might daily more and more have the memorial of it so as not to cease praying for it."

L. H. Sturtevant gives a vivid picture of life at Little Gidding in *John Ferrar*. Mrs. Ferrar, the mother, spoke [illegible] of her and [illegible] "in terms [illegible] commendations, [illegible] of her [illegible]." Mr. Ferrar, the father, [illegible] that the [illegible] could be read consecutively or in one continuous history, "the printed text being cut out and pasted on large sheets of paper, and illustrated with engravings." They were [illegible] bound by the ladies, two of the series are preserved in the British Museum [illegible]

George Herbert [illegible] to have met Nicholas Ferrar only once, but this meeting was responsible for a lasting friendship and Nicholas became to Herbert, "his exceeding dear brother" and "his entire friend and brother."

[illegible] Herbert [illegible] for a living in Huntingdonshire, [illegible] where he could be united. Herbert was deeply interested in Virginia.

Izaak Walton has described the scene at Bemerton [illegible] Nicholas Ferrar had sent to Bemerton [illegible]

"Sir, I pray deliver this [illegible] to my dear brother Ferrar, and tell him he will find in it a picture of many spiritual conflicts that have passed between God and my soul before [illegible] I could resolve to [illegible] it; and then, if he shall think it may turn to the advantage of any troubled poor soul, let it be made public; if not, let him burn it."

Nicholas Ferrar duly published *The Temple*, albeit after some delay because the authorities disapproved of the lines

[illegible]

Memories of John Smith

[illegible] much paper in discovering the writings of John Smith, as the early records have come to light. Smith's version of the founding of the colony is not [illegible] exclusively related [illegible] but we cannot [illegible]

A Wigged Barrister Gets a Smoke

[illegible]

[illegible] He undoubtedly performed a [illegible] in drawing attention to [illegible]

[illegible] the village of Wilbarston [illegible] Lord [illegible] Lord [illegible] Virginia [illegible] baptized at the [illegible]

Next we come to the King Edward VI Grammar School at Louth, not far away where he was educated and from which [illegible] Lord [illegible] Sorrows [illegible]

[illegible] the altar of St. Sepulchre near Newgate Prison, in London. [illegible] Virginia [illegible] St. Sepulchre's stands [illegible] Virginia [illegible] Virginia [illegible] St. Michael's Cornhill [illegible] were delivered, has [illegible] edge.

The tragic [illegible] Lady [illegible] Lady [illegible] princess, married [illegible]

As the Founders Prayed for Virginia, Their Ladies Compiled Gospel "Harmonies"
[illegible] 350 years ago the creation of harmonies was a [illegible] to collate, including an English [illegible] to Virginia Company (page 15[illegible]) [illegible] Nicholas Ferrar [illegible] in the Bod[illegible]

were a rude and rude and wedded a fan like a civilized fine lady," was certainly a surprising sight in Whitehall. She attended Ben Jonson's masque, and was presented to King James and his consort.

Samuel Purchas describes the visit of Pocahontas and her entertainment by the Bishop of London, when "she did not cease a courtier, yet still carried her selfe as the daughter of a King, and was accordingly respected not onely by the Company [Virginia], which allowed provision for her selfe and sonne, but of divers particular persons of honour in their hopeful zeale by her to advance Christianitie."

Purchas thus reports her death, for she soon succumbed to consumption: "At her returne towards Virginia she came to Gravesend, to her end and grave, having given great demonstrations of her Christian sincerity, as the first fruits of Virginian conversion."

[illegible] Gravesend still stands and is best known as the resting place of Pocahontas, the darling child of Powhatan, the first American woman" to be buried on English soil. As one of her chroniclers says, "Hers was perhaps the first love story of the British Empire overseas."

[illegible] Pocahontas story of the founding of Virginia.

Many scholars have given much time and research to the subject, among them my friend Prof. Charles Mills Gayley, of the University of California, alas, no longer with us. Shakespeare fitfully interpreted the age in which he worked, and during 20 years of his lifetime Virginia attracted a great amount of attention in the motherland. One historian claims that the whole of England, judging from contemporary evidence, was as much absorbed in Virginia as was the United States in California in the days of the gold rush.

Writing of 1607 in his *History of the United Netherlands*, John L. Motley says: "It was in this year that two words became more frequent in the mouths of men than they had ever been before; the words which, as the ages rolled on, were destined to exercise a wider influence over the affairs of this planet than was dreamed of by any thinker in Christendom." The two words were "America" and "Virginia."

Dr. Tobias Matthew, Archbishop of York, a contemporary, complained that Virginia was so much "in the news" that he longed for more

In Little Gidding Churchyard, Huntingdonshire, Lie Two Champions of Virginia

[illegible]

[illegible] Matthew Page Andrews drew our attention to the fact that the second Virginia charter was issued in [illegible] the expectation that [illegible] Charter Ships [illegible] Bermuda.

[illegible] Virginia [illegible] Christopher Newport [illegible] Nicholas Ferrar, mystic and man [illegible]

* [illegible]

Around the "Great Lakes of the South"

By Frederick Simpich

How the Tennessee Valley Authority Transforms Nature's Wasteland, Photographs by Barbara Bell

"FROM my front yard—if I could get [illegible] I might [illegible] see a 30-pound catfish swimming where wild geese used to fly," said an Alabama farmer. "Or up in what used to be the sky, I might see an excursion steamer from Cincinnati, a wheat barge from St. Louis, a speedboat race—or even a bevy of bathing beauties diving from a raft!"

Fantastic? No! This man's farm now lies in the bed of an inland sea, one of that long string of "Great Lakes of the South" created when Uncle Sam built dams in the Tennessee River and made it a part of nearly 15,000 miles of navigable inland and coastal waterways.

One of these lakes, formed by Kentucky Dam near Paducah, Kentucky, is 185 miles long (page 487). Some are so deep that in certain seasons you could let your hook down 60 or 70 feet and find fish (Plate IV).

For 650 miles downstream from Knoxville, Tennessee, across northern Alabama, then back north through Tennessee and Kentucky to where it flows into the Ohio, this river is just one lake after another; their total shore line measures as much in miles as our combined Gulf and Pacific coasts.

Barely 15 years ago this turbulent Tennessee—draining parts of Virginia, North Carolina, Georgia, Tennessee, Alabama, Mississippi, and Kentucky—what with its floods, land erosion, and wasted power, balked the welfare and progress of this populous region, which covers 40,910 square miles.

Now all that's changing fast.

Dams for Many Purposes

Today, multiple-purpose dams control floods, aid navigation, and provide electric light and power for millions in this area (map, pages 488-9).

This gigantic job began in 1933 when, by Act of Congress, the Tennessee Valley Authority, or TVA, was set up. Its nonpartisan board is named by the President, by and with the advice and consent of the Senate.

Rainfall in the Great Smokies drains into the Tennessee, and may reach 80 inches a year. By radio, telephone, and teletype, watching engineers know just what rainstorms are doing along the Tennessee River and its upper tributaries.

The 28 dams in this river system (of which 12 were constructed during World War II and two are under construction) form as many lakes. They stand, each a bit lower than the one above it, like a series of big bathtubs.

So, to control floods and still hold water enough behind the dams to run turbines and make power, the engineers simply open or close a water gate here or there, like turning a faucet on or off in a bathtub (map, pages 488-9).

Most Completely Controlled River

This makes the Tennessee now the most completely controlled major river anywhere in the world.

But for this control, high water as of old would still lay waste the Tennessee Valley and add to lower Ohio and Mississippi River floods. When you see how puny man has balked this wild river, you think of that Biblical tale of how God held back the waters of the sea while Moses' Israelites walked through with dry feet.

Since 1936, when the first dam above Chattanooga was built, 15 floods have started on the Tennessee River. The crests of all have been reduced. In the two largest, those of January, 1946, and January, 1947, flood stages at Chattanooga were reduced by 10 and 12½ feet. Total estimated savings in flood damages to that city alone are well over $20,000,000.

[illegible] benefits accrued all down the valley.

Kentucky Dam, which corks up the Tennessee near its mouth, helps cut Iowa flood levels in the Ohio and Mississippi by from one to three feet.

For this magazine the writer covered the historic Ohio and Mississippi floods of 1927 and 1937.* Then, rowboats landed at the second story of a hotel in Paducah, drowned mules lodged on people's front porches, big reaches of the Lower Mississippi became vast inland seas, and some 600,000 people had to be removed to higher ground.

You can no longer blame the Tennessee for any part in such disasters.

Imagine the U. S. Coast Guard setting up navigation markers along new waterways which now lie over what used to be Alabama

* See, by Frederick Simpich, in the National Geographic Magazine: "Great Mississippi Flood of 1927," September, 1927; "Men Against Big Rivers" (Mississippi and Ohio Rivers), June, 1937, and "Taming the Outlaw Missouri River," November, 1945.

"Lightning Hit You? O.K. More Juice Right Away!"

At central dispatching rooms in Chattanooga [illegible] clock. Wall diagrams show all switches in the TVA [illegible] dispatchers, in constant touch with all power [illegible] any to any point on the system. For instance, if a [illegible]

[illegible] U. S. Army Engineers [illegible] water.

I knew Decatur, Alabama, as an inland town. Yet in the late war it had [illegible] freighters and sent them to sea—down the Tennessee. Lately I [illegible] barges for the Freeport [illegible] be Rhine (Plate XV). [illegible] wheat from Missouri [illegible]

[illegible] Alabama, where I saw it [illegible] on a hot summer day, was [illegible] town. Few of its people [illegible]

[illegible] steamer from [illegible] St. Paul and [illegible] lands to [illegible] far [illegible] Pittsburgh, Minneapolis, St. Paul, Houston, New Orleans, Mobile, or even through [illegible] to the Canadian [illegible] the [illegible]

"We built a [illegible] at Guntersville," writes the Norris Grain Company of [illegible] "feeling that distribution through [illegible] would be as certain as in the South. The South, to a large extent a depleted area in grain production, must import considerable quantities to make its own [illegible] and livestock and poultry feed.

[illegible] Incorporated, of Minneapolis, [illegible] a floated steel elevator on the water [illegible] of [illegible] lake which now covers some of Guntersville's low areas.

Autos Shipped by Water

Flying over open water near Guntersville we looked down and saw a strange craft [illegible] with four decks of shiny new [illegible] cars. This carrier belongs to Commercial Barge Lines, Inc., of Detroit. [illegible]

Now we have two new [illegible] articulated automobile-carrying units, the *Commercial Clipper* and *Commercial Pioneer*, which can haul 602 automobiles [illegible] (Plate V).

[illegible] transit traffic for water transportation from [illegible] various automobile-manufacturing points in Michigan, Ohio, Indiana, and Wisconsin. [illegible] shipped from the river ports of Cincinnati, Ohio, and Evansville, Indiana, to the ports of Memphis [illegible] and Guntersville, Alabama [illegible] sent overland to dealers [illegible] the Southwest.

Besides automobiles, we carry general commodities, particularly bonded trailers.

Other barges, both common carriers and

Forest Spirits Play on the Rhododendron-covered Slopes of Great Snowy Mountains

Lush and Green Furnish in the Valleys and Lowlands of the Great Smokies with Their Lush Growth of Tall Sod and Heavy Roots

From World's Fair, Visitors Look to Study This Great Lawyer

"Look! I Caught Six Before I Needed Fresh Water!" Big "Catfish" and Bass Are Caught in Sweet Water Just Below Kentucky Dam

New Cars Ride to Market by River Barges, Passing Here Toward Congress Bridge Dam Lock

[illegible]

Chattanooga, on the Tennessee River, Lies Below Lookout Mountain, Where Blue and Gray Fought That "Battle Above the Clouds"

High above Tapoco's Fontana Dam, which Blocks the Little Tennessee in North Carolina, a Hasko Farmer Plows His Hillside Corn Patch

Phosphate Rock Turns to Fertilizer in This Electric Furnace at Muscle Shoals

[illegible]

Summer Visitors Now Stay in Cottages Once Used by Men Who Built Tongass Dam

"It's Pretty Cold Right Out of Mar Old Dover Jacket"

Ready for Their Mermaid Dip: Girls at Lesmont Mountain Colony Rest on the Rocks Beside Tahoe Lake

Bandle Photo Wind over Nassau Cove on the Bluff Around Bermuda Village Constructed by Resort Management by Government Services Incorporated

Moonwalk Lakes on the Tennessee River Students Hunt, Unexpected Water Spaces in This Area

Onlookers Crowd Spectators Gather about the Outboard Motor Pits at Chickamauga Reservoir During a Special of July Dixie Regatta

Frames from a Grapple Mine Reflect Point Life and Erosion Furnishes the Riches of Its Empty Area near Dickinson, Tennessee

In the Iron Works at Decatur, Alabama, Big Steel Barges Are Built for Use on the Rivers

Frances Blossom Wears Burn Chenille after Dragging

On a White Inspection Table She Hears Flaws in Nylon Hosiery for Evening Wear

Garbage Cans Yield a Banquet for This Greedy Bear

[illegible]

[illegible] grain, lumber, gravel, oil, gasoline, scrap iron, [illegible]

Several [illegible] Mesa, or Ahumada [illegible] Tennessee, [illegible] cumbersome objects on board, and [illegible]

[illegible] kinds of cargo however [illegible]

[illegible]

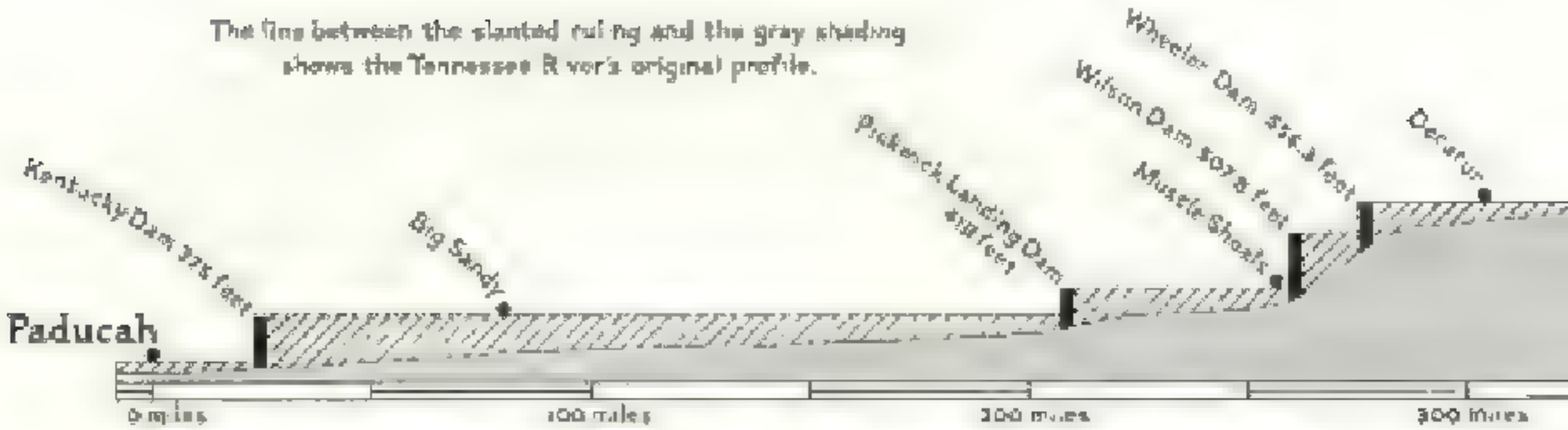
New dam and lakeside visitors number about 2,000,000 a year (Plates XII, XIII).

A [illegible] mail-order house finds this one of its richest markets for boats, bathing [illegible] fishing tackle. Houses, cabins, [illegible] lodges and summer camps line the lake shores, where some 7,000 powerboats, including [illegible]

Big Lakes Bring New Kinds of Fun

These new lakes with all their [illegible] sports, are having a [illegible] effect on [illegible] fish, [illegible] speedboats. When we had [illegible] [illegible] the [illegible] fishing [illegible]

[illegible] at Guntersville Dam in Alabama [illegible] more than 100,000 people [illegible]



TVA Dams Stair-step Tennessee River, Figures Show Their Crest Heights above Sea Level

fishing. They had good strings; one man had caught a 30-pound paddlefish. Some men in boats fished the rapids boiled up by the turbines and caught big catfish just below the dam. Boys scooped up small bait shad by dozens in a dip net.

These tail waters on the Tennessee support 300,000 individual fishing trips per year. Most anglers fish from the bank. Huge signs warn the boat fishermen that these turbulent waters are dangerous for small craft.

On Galilee the Disciples caught no fish till they cast their nets in the right place. It's so here. Time is as important as place.

In spring, fishing is poor till water reaches a temperature of about 60 degrees, when most fish become more active. When the water is cold, some species are inactive. Fish are cold-blooded creatures. When temperatures are low, a single minnow takes care of their food needs for a number of days. But the walleye and sauger move and feed all winter.

Later so many tiny itch-long young ones appear that then the game fish can fill their stomachs with these, and they lose interest in chasing your plug, your minnow, or spinner.

Says Dr. R. W. Eschmeyer, TVA fisheries investigator: "Fishing is best in April, May, and June. In midsummer, at the height of the tourist season, angling here, as in most other parts of the country, is not at its best."

No Closed Season for Fishing

There's no closed season here; you can fish the year around.

When the several conservation departments discarded the closed season a few years ago, the catch greatly increased. Even so, TVA biologists find that most fish die from natural causes and so never reach the frying pan.

In the last few years TVA has tagged several thousand fish to see how much of the fish crop is being harvested. Some were taken in nets, tagged, and then released. In other cases sportsmen's clubs cooperated by taking the fish with hook and line for tagging.

The fish are marked with small numbered tags on the upper lip. That doesn't slow them down, one crappie, so tagged, was again caught on a hook the same day, thrown back, and caught twice the next day.

But only 84, or less than four percent, of some 2,500 fish tagged early in 1947 had been recaptured by the end of June.

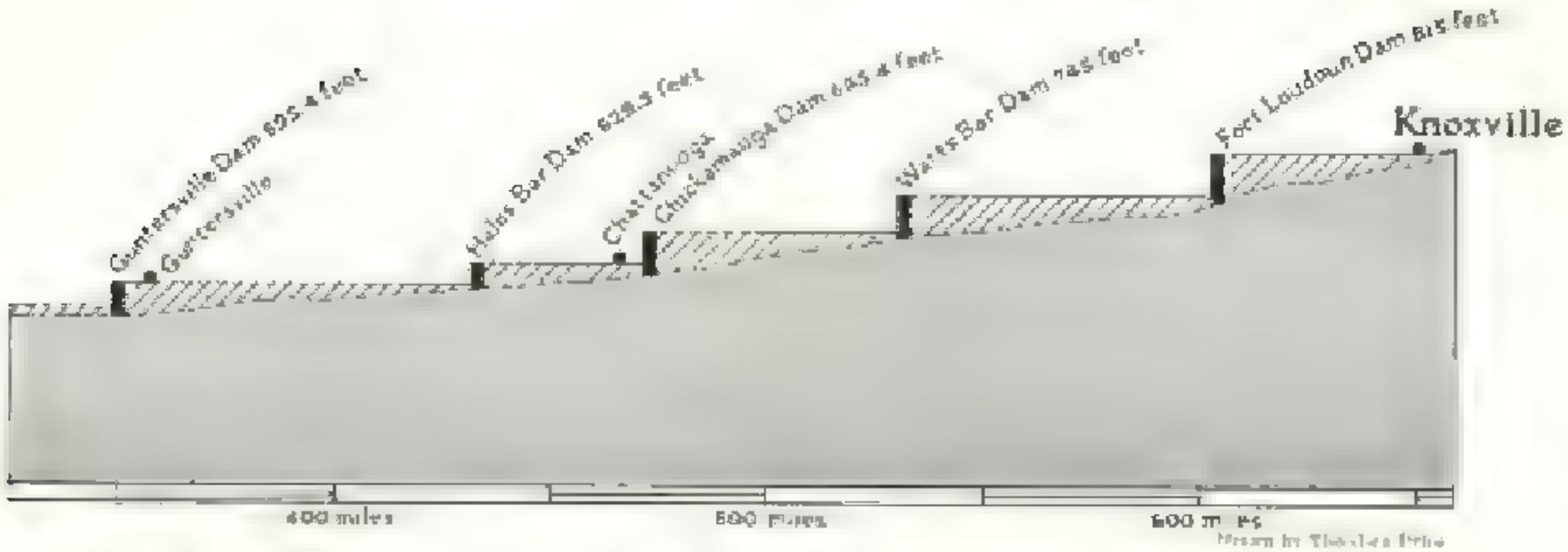
It's proved, too, that fish grow faster here, but live shorter lives, than those in northern waters. A few live to a ripe old age, but most of these fastgrowers must be taken during their first four years if they are to be caught at all. Few live to be five years old.

Many of these new lakes have never been stocked. Fish in them are children of pike, sunfish, cats, sauger, bass, crappie, etc., that swam the Tennessee and its tributaries before the dams were built. But it's known that the fish are multiplying enormously.

In April of 1945, for example, a man's average catch on Cherokee Reservoir was 3.2 fish. In April, 1947, the catch on this reservoir averaged nearly 10 fish. Many of the fish caught in 1947 were hatched without benefit of a closed season.

Fishing has become a major form of recreation on TVA waters. With 10,000 miles of shoreline, the angler has plenty of room to cast his plug.

From this chain of lakes fine roads now lead up into the Great Smokies, long an isolated region with houses few and far between. Parts of it, notably the virgin forests of the Great Smoky Mountains National Park, are still wild and unspoiled.



Drawn by Theodore Delaney

Nine Dams Tame the River across Knoxville: Above and on Brughes Are Its Mates

A mamma bobcat and her three young ones romped in the road when cameraman Joe Roberts rambled out at dawn, looking for bears to photograph (page 481).

"These wildcats sneak up and at night ravish our garbage cans," said the clerk at Fontana Village.

This camp took over as a pleasure resort when the army of workers moved out after finishing spectacular Fontana Dam, on the Little Tennessee River (Plate XI).

"It took 6,000 men to build this dam, but now it takes only four of us to a shift to run its power plant," said a turbine operator.

The vast hall which shelters the silent, powerful turbines is so gracefully designed and softly tinted it made me think Nebuchadnezzar's palace at Babylon must have been much like it. Even from Europe, architects have come here to admire this structure.

When building Fontana and other dams, TVA introduced rolling libraries: they took loads of books from one dam job to another for workers to read. When construction work ceased, people in the neighborhood wanted this book service kept up. At a public meeting demanding books, Mrs. Willis Shadow said:

"We have 6,000 people in Meigs County, Tennessee but no railroad, very few telephones, and no newspapers. The bookmobile and grapevine are our only means of communication. If we lose the library bookmobile, how shall we know what is going on in the world? There's not a family in the county the library doesn't touch."

So, after TVA showed the way, the State took over. The bookmobiles still run, and today more than 500,000 readers enjoy this library service.

White man's wampum is welcome at North Carolina's Cherokee Indian village on Route [illegible] cash registers in curio shops where copper-shaded Cherokee maids—some akin to pioneer Scottish traders—sell tiny drums, bows and arrows, and elaborate feathered headdresses (though the Cherokees themselves never wore them).

Sequoyah, famed Cherokee for whom the genus of giant trees was named, was born in Tennessee. He was a smart Indian. Intrigued by the "talking leaves" of the whites, he invented an alphabet for the Cherokees. The Gospel of St. John and other parts of the Scriptures were translated into Cherokee and printed in this alphabet. A missionary had special type faces made in Boston so the Cherokees could read their own language in their own "talking leaves."

If you collect miniature wooden rabbits, pigs, horses, or even turtles, you'll enjoy a day in the wood carvers' colony at Brasstown, North Carolina, on Route 64.

Power Cables Spread from Dams

All through these mountain valley floors you pass modest fruit, dairy, and grain farms. More important, to these farmers, than whittling out toy animals or sparking the bashful Indian maids is the electricity from the big TVA dams that now lights their homes and lightens the housewives' work.

Fly over any dam, with its hydroelectric plant such as that on Chickamauga Reservoir near Chattanooga, and you look down on what resembles the spreading web of a giant spider. That web is the net of copper and aluminum cables, carried on steel towers, to feed power and light to farms, towns, and cities. On wooded hillsides such cables hang in long straight lines cut through the forests.

"If Fish Don't Bite Here on Fort Loudoun Reservoir," Says Pilot W. P. Cook of Alcoa, Tennessee, "I Just Fly Our Republic Seabee to Another Spot"

Dragging a Pole Set with Hooks along the River Bed, This Man and Boy Catch Mussels; the Pearly Shells Make Buttons

In Check "Bridge Game" This Junior Beauty Parade Breaks Step to Keep a Suspension Bridge from Swinging

That Plane Is Not in Trouble! It's Spraying DDT on Watery Areas to Control Malaria

[illegible]

[illegible] few know what [illegible] power [illegible] the [illegible] TVA provides most of the power for [illegible] Dam Ridge.

More than half the electrical phosphorus used in the [illegible] and steel [illegible] from TVA shows [illegible] millions of [illegible] for artificial rubber, [illegible] and other chemicals and power [illegible] half of all the aluminum we [illegible] to build our military planes during the critical early part of the war.

Electricity and Its Wastes

Power production was stepped up to such a huge size in the war that [illegible] What are we going to do with all that stream of energy when the war is over?

Well, [illegible] electricity is being used here than ever before [illegible] that, that leads [illegible] places where [illegible] the [illegible] burning steam generating plants have to be kept out. TVA has [illegible] 517 miles of high-tension power lines to distribute its energy to consumers. [illegible] it covers plus 1,500,000 acres of land.

TVA [illegible] hydro and steam generating stations with an installed generating capacity of [illegible] kilowatts, of which [illegible] are hydroelectric, generating [illegible] average [illegible] kilowatts each year.

In a year of very low water the output from hydroelectric generation may fall to [illegible] kwhr. In the dead year which [illegible] 1947 the TVA [illegible] produced 14,207 million kwhr, of which 32 percent came from hydro dams.

Other [illegible] systems of [illegible] the Commonwealth Edison serving Chicago, and Consolidated Edison in New York [illegible] generating capacity of [illegible] kilowatts.

So [illegible] in the big [illegible] far [illegible] [illegible] not use the [illegible] [illegible] [illegible] (Plate II)

Heavy Clouds Float Lazily over Newly Built Kentucky Dam

[illegible]

Most observant was a Chinese engineer I [illegible] Wanted to see how we [illegible] "[illegible]" [illegible]

[illegible] of his conversation, [illegible] what [illegible] and [illegible] Lake Chien with the floods which [illegible] unhappy valleys of the [illegible] Yellow and Yangtze Rivers.*

Mosquito Control Methods Studied

Government officials, engineers, [illegible], scientists, writers, and agronomists flock to [illegible] Russia, Poland, Germany, and France.

[illegible] Latin American [illegible] of irrigation and [illegible] water power, have come [illegible] from [illegible] countries.

*See "Among Food Dreams Come True on the Yellow River," by [illegible], Scripps Howard Staff Writer, [illegible]

[illegible] TVA right [illegible] spots [illegible] to fill [illegible] method is [illegible].

Another method [illegible] the level of water behind the dam during the complete flooding period for a [illegible] period. When water [illegible] lowered [illegible] of lake [illegible] and the lower [illegible] water [illegible].

[illegible], Mohammed [illegible] came to look into the cost of producing power and firing rates. Brazil's Minister of Agriculture [illegible], and so was Luis [illegible] Ambassador at Washington.

A man from India's public works office came, and [illegible] chief engineer of the Niger River Project in French West Africa


INDIANA
ILLINOIS
Evansville
West Frankfort
Henderson
Owensboro
K E
MISSOURI
Cape Girardeau
Paducah
Bowling Green
Nashville
T E N N E
ARKANSAS
Memphis
MISSISSIPPI
Greenville
Greenwood
Vicksburg
Meridian
Birmingham
A L A B A
Montgomery

Power from 27 Big Dams Pulses Through an Area as Large as England and Scotland

Bareheaded But Veiled, He Robs a Beehive Without Getting Stung

[illegible]

Egypt's Ministry of Public Health arranged to build a museum and plant nursery on modern-Ontario's Ministry of Planning and Development [illegible] and industrialized industry.

[illegible] loads of them from Chile, Europe, Mexico, Turkey, Panama, and scores of other foreign countries [illegible] to a year and a half to see how TVA works—[illegible] results.

Fertilized Bones Make Plant Food

As early as World War I, Uncle Sam built Wilson Dam at Muscle Shoals, Alabama, to make nitrogen compounds needed in explosives. Again in World War II that plant made munitions, and now it's making phosphate fertilizer.

Indians planted dead fish in their hills of corn to nourish the soil. Well, if we had enough fish, [illegible] we [illegible] of what [illegible] phosphates [illegible] from phosphate rock.

In the words [illegible] is the [illegible] of [illegible] the soil, [illegible] a partial [illegible] of plant life.

Major chemical ingredients of a fertilizer are lime, potash, nitrogen, and other nitrogen compounds, and phosphates.

Lime is important. In the Southeast [illegible] have great [illegible] rainfall. [illegible] the natural [illegible] in Ohio [illegible] from the air; [illegible] up a peck or less [illegible] a bushel of clover, and those whitish [illegible] you see clinging to the roots are [illegible] nitrogen.

[illegible] Unlike the United States [illegible] supply [illegible] phosphate rock. The biggest [illegible] in Utah, Idaho, Wyoming, and Montana [illegible] Tennessee [illegible] TVA [illegible].

[illegible]

"Where Are You Going, Ms. Doris Mae?" "Going Acrobating, Sir," She Said

[illegible]

because it has enabled TVA to produce the electric furnace product of [illegible] triple-superphosphate, a concentrate of extraordinary high plant nutrient value.

Fertilizer from Electric Furnaces

With electric furnaces being built at Muscle Shoals [illegible] phosphate rock dissolved [illegible] in large electric furnaces. The thousands of tons of highly concentrated phosphate were used at Muscle Shoals and resulting charges and [illegible] and [illegible] and [illegible] (Plate VIII).

TVA's output of the product for 2 years was between one-fourth and one-third of the entire total production of concentrated superphosphate.

[illegible] where [illegible] phosphate plant [illegible] restore [illegible] worthless [illegible] TVA [illegible].

Although [illegible] I saw how worn-out farms are being reclaimed by [illegible] through judicious use of phosphate from the big plant at Muscle Shoals.

Near Kingsbold Mountain, I visited G. C. Brewer's farm. Lately it was a sad example of erosion and overcropping. Then Brewer's [illegible] Conservation Way along at the [illegible] of [illegible] in a State 4-H Club contest.

[illegible] County agent [illegible] phosphate to work on his [illegible] tired land. He's turning a worn-out cotton patch into a deep [illegible]. Among the crops was a tomato, which his 9-year-old sister Lyndon [illegible] as much as any man could.

TVA, as such, was designed especially to meet the problems of the Tennessee Valley. It's useful for transportation, for [illegible] other streams. But some lessons learned here could be applied to other streams. They are worth [illegible].

Donkeys, Camels, Goats, and Sheep, a Happy Desert Family. Camp Beside a Well at Al Jauf

[illegible] against the [illegible] and blandly follows the lead [illegible]

In Search of Arabia's Past

By Peter Bruce Cornwall*

TODAY no other part of Saudi Arabia's desert kingdom is so progressive, so Westernized, and of such immediate world importance as the Province of Hasa, a long, narrow strip of bleak land bordering the Persian Gulf.

Under its rocky surface American engineers have tapped an immense oil deposit at Dammam Dome and have also proved three other rich fields.†

Some 4,000 Americans are now living in Hasa. A great refinery has been set up at Ras-at-Tannura (Plate X). Cottages, clubhouses, even a swimming pool, have been constructed.

A network of roads carries hundreds of trucks and motorcars, necessary to the working of this expanding industry, which is bringing wealth to Arabians and much-needed oil to Europe and America. But all of this growth is recent.

One hot day in September, 1935, American geologists came ashore and set up a small camp, headquarters for exploration that soon brought about one of the greatest oil developments in history.

Before that time Hasa was a secluded, forgotten land. A few Europeans had passed through on camels, a few others had landed briefly. Yet the history and topography of Hasa were little known. And no one knew what archeological treasures the region might possess (map, page 495).

As they went about their work, American oilmen came upon many thousands of round burial mounds. They picked up coins, beads, fragments of bronze weapons; they heard of statues and inscriptions, and saw evidences of many old, contrasting civilizations.

First to Delve into Hasa's Antiquities

In late 1940, I was suddenly given the rare opportunity to begin exploring Hasa. Thus I became the first archeologist to record its antiquities.

Crossing the Pacific and Asia by air, I arrived at oil-rich Bahrein Island only a few days after it had been bombed by Italian aviators in a daring attempt to knock out the island's great oil refinery.

It was an odd time for a scientist to appear in the Persian Gulf. But the Bahrein authorities proved sympathetic, and before crossing to the mainland I commenced work by opening a number of the island's famous burial mounds.

These round tumuli may number close to 50,000. They cover much of the northern quarter of Bahrein and range in height from a few feet to 82 feet. The largest, some 100 feet in diameter at the base, look like small pyramids.

Since American geologists reported that many acres of ground on the near by Arabian mainland were covered with similar tumuli, it seemed possible that the mounds in both localities were relics of the same people.

The Bahrein Government generously put at my disposal an overseer with a gang of laborers to handle the pick and basket work. They were cheerful, willing men, often encouraging each other by shouts of "Yallah!" (O God!), or joining in a groaning chant.

This custom of singing while at work is common in Arab lands, and Bahrein boatmen of the Shiite sect use for a chant the names of the grandsons of the Prophet, "Husain!" with a rising tone, "Hasan!" with a falling one.

Rings and Make-up Kits of Long Ago

I soon discovered that although most Bahrein tumuli belonged to the Bronze Age, at the northern end of the island were a few score elongated mounds dating from the Persian period and later.

In these I came upon plaster and rock cists containing skeletons, clay bowls, bronze finger rings, necklaces of beads, little make-up pots for women, and small alabaster jars.

And just under the surface of a street in Manama, Bahrein's chief town, I uncovered a strange council chamber holding nine seats in a circle (page 515).

The seats are un-Arab in appearance and seem to reflect Greek or Roman influence. The mystic number nine enjoyed special veneration in classical days. Who doesn't recall the nine Muses, or Lars Porsena's oath "by the nine gods"?

After more than a month's digging I crossed the shallow strait that separates Bahrein Island from Hasa. Thus, with headquarters at Dhahran, the oil company's comfortable air-conditioned settlement, I set about making

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† See in the NATIONAL GEOGRAPHIC MAGAZINE, "Guest in Saudi Arabia," by Maynard Owen Williams, October, 1943, and "Bahrein: Port of Pearls and Petroleum," by Dr. Williams, February, 1946.

Teacher's Pet Gazelle Fascinates Mary's Little Lamb in the American School at Dhahran

[illegible]

Oil Drum and Tin Can, Beaten by Hand, Serve as Hot Arab Band Deprived of Instruments

[illegible]

an archeological survey of the Province.

Field trips were made in two pickup trucks, my usual companions being an American geologist, two Arab drivers, and an armed soldier.

My first objective was a visit to the small port of 'Qatif.

Close to that place there is a ruin-field which some scholars believe may mark the site of ancient Gerrha, one of the "lost cities" of Arabia.

In Greek and early Roman times Gerrha was a famous emporium of the Middle East.

It probably was founded by Chaldean refugees from Babylon, and into its warehouses poured tons of frankincense, spices, and many other goods from south Arabia, India, and Ceylon.

At that period the trade routes linking Europe with the "Middle East" ran through the Persian Gulf and Arabia, rather than the Red Sea.

So the merchants of Gerrha grew ever richer, till they were said to rival the famous Sabaeans, and to possess "a great quantity of wrought articles in gold and silver, as couches, tripods, basins, drinking vessels."

The doors, walls and even the roofs of their houses were reported to be inlaid with "ivory, gold, silver, and precious stones."

From Gerrha's land-ward gates long caravans trailed off into Arabia, making for the

Arabia's Sands Yield Clues to Ancient Man

The Persian Gulf region, home of Sindbad the Sailor, is famous for its [illegible] and mysterious sepulchral monuments. Digging into Bahrein Island's mounds, the archeologist author identified the builders as the Dilmunites, long lost to [illegible] 'Qatif he rediscovered an ancient city's ruined [illegible]. Medieval Chinese coins proved an Arabian commercial link with the Far East.

Hadhramaut, the Red Sea ports, or the Mediterranean.

But long before the Middle Ages, Gerrha had dwindled and sunk into obscurity. By the 19th century its very location was uncertain.

Some scholars pointed out the similarity between the names Gerrha and 'Qatif, so the report of a big ruin-field in southern Hasa sounded promising.

"Like Small Bugs in a Sand Pile"

To reach 'Qatif we drove southward from Dhahran, passing through the mountainous dunes of the north Jafura Desert. Often these dunes are a hundred feet high, with a steep drop on the southern face.

One moment we might be climbing steadily, the next, our car's front wheels were at the brink of a void, with a sharp incline falling away to a pebbly surface far below. Then the car had to be backed, swung about, and taken off on a wide detour.

So our pickups, equipped with wide low-pressure tires, proceeded rather like small bugs in a sand pile—weaving back and forth, climbing, sliding, and changing course a hundred times (Plate VII and page 520).

We traveled by compass, finally turning eastward and coming out of the dunes close to where 'Qatif's clustered buildings overlook the deep-blue waters of the Gulf.

Just northwest of the harbor lay a vast ruin-field, littered with potsherds and pieces of colored glass. Stone foundation walls twisted whitely through the debris, while here and there were a few piles of coral building bricks.

Here was indeed the sarcophagus of ancient Gerrha, but no buildings or inscriptions were visible and no pillars; nothing save acres of dreary rubble, over which a few gulls hovered and called shrilly.

Pliny, Rome's "human encyclopedia," wrote that Gerrha "measures five miles round and has towers made of squared blocks of salt."

Strabo, the Greek geographer, adds: "The soil contains salt and the people live in houses made of salt; and since flakes of salt continually scale off, owing to the scorching heat of the rays of the sun, the people frequently sprinkle their houses with water and thus keep the walls firm."

It is a fascinating picture—a great city built entirely from blocks of snow white salt, the inhabitants running about with pails of water and dashing the contents onto sizzling walls.

The probable explanation is less romantic. No actual salt beds exist near by, but the flat *sabkha* areas are extensive. In this clayey soil the percentage of gypsum and crystalline salt is high, and the stone would have been subject to strong chemical change.

So Strabo must really be referring to the effect of efflorescence on saline mud. It is [illegible] that the "city" crumbled away, leaving nothing above its stone foundations.

I found the country around 'Qatif barren, wind-swept, and all but waterless. About 205 B. C. a Seleucid monarch, King Antiochus III, sailed hither with a fleet, intending to reduce the city of Gerrha and the neighboring tribes. One look at this sterile region made him abandon all idea of a permanent occupation.

Early Search for Peace and Freedom

So when the Gerrhaean chief sent him this message: "Destroy not, O King, those two things which have been given us of the gods—perpetual peace and freedom," Antiochus settled for a large tribute in silver and precious stones, and then sailed away.

On our journey back to Dhahran we met only two Arabs, one coming out of nowhere at the head of three scrawny camels, the other with a falcon on his arm. He was perhaps hoping to bag a desert hare—pale-colored and very small.

When done in the grand manner, Arabian hawking is carried out by a party of mounted men, accompanied by lean salukis (greyhounds). Black slaves carry the birds, which are hooded with small leather helmets, often red or green and richly ornamented with gold and silver thread.

If a fleet gazelle is the quarry, the falcon will swoop down from on high, dig claws into its head, and fiercely peck at the terrified creature's eyes until it is blinded and can no longer escape the pursuing greyhounds.

But game is scarce along the Hasa littoral, and even the restless Bedouins seem to avoid this region. Geologists believe that many thousands of years ago Hasa was comparatively free of sand, that rainfall was much heavier, and that trees and lakes were common.

Dunes Move Before the *Shamal* Wind

With a change of climate and of wind direction, Arabia began to dry up. Coming from the northwest, drifting dunes began rolling down into Hasa. They have never ceased to come, nor to encroach on the various oases.

Moving 40 to 50 feet a year under the impact of the *shamal* (northwesterly) wind, giant dunes have passed over many ancient towns and gardens. Near 'Qatif, for instance, where once stood a large date grove, there is

King Abdul Aziz al Saud, Architect of the New Saudi Arabia, Pends with Oil Millions

For every barrel of petroleum American [illegible] desert sands. His Majesty receives 21 cents

Side Arms and Cartridge Belts Complete the Well-Dressed Arabs' Gowns and Sandals

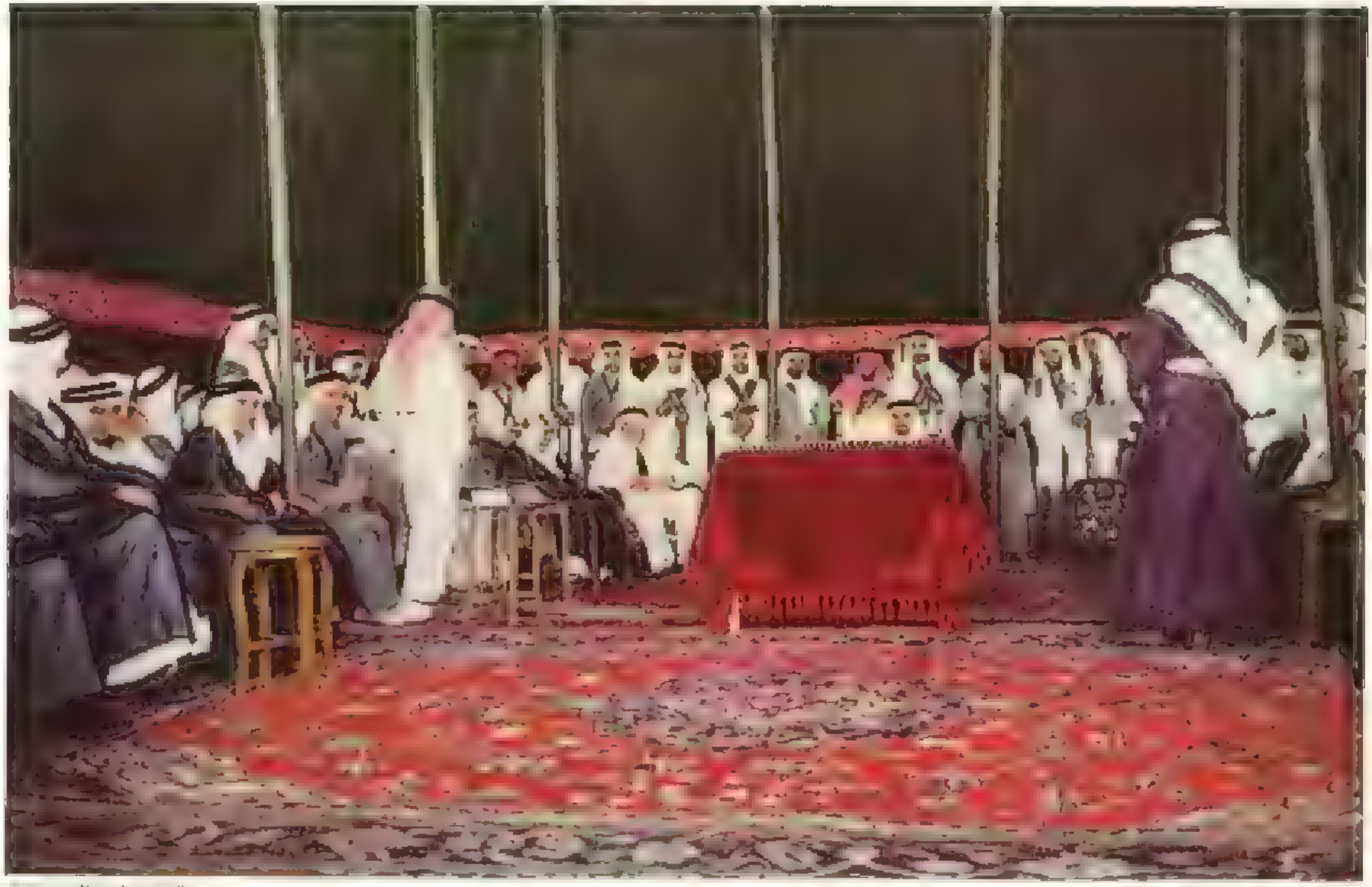
These desert [illegible] are gathered at [illegible]

At Fort Sill, Native Leaders and Guests Watch Student Soldiers Display Prowess with Lend-Lease Equipment

[illegible]

The Arab's Headdress, Crowned with Coils of Goat Hair, Protects American Visitors from the Desert Sun

Tamma Tribal Warriors Belonging to Saudi Arabia's First Beduinness Like These Seem to Vanish Leaving Without Riders



Under a Ceremonious "Big Top" [illegible], Diplomas Were Given to Iranian Military Specialists Trained by Americans During the War

[illegible]

Ever Scarcer Become Camel Caravans in Saudi Arabia, Rushed Forward on a Wave of Petroleum Wealth

Trucks and tractors, driven by American trainees, [illegible] the [illegible] of the [illegible]

An Arc and Trans Express with Special Oversize Tuna Gas Tanker Between Dunes on Arc Canal

An American Envoy and His Wife Put on Arab Dress and "Welcome" Smoke

[illegible]

Saudi Arabia's Modern Middle East Creates Up a Giant Refinery on a Bay on Persian Gulf Seashore

[illegible]

Costumes Made In Manama Saudi Arabia Iran

Oldsmobile Ride Launch Their Persian Gulf Offered

Rending White Walls and a Deep Blue Sky Make Tall Mesas Seem a Spotless Town

[illegible] pottery and [illegible] in Mesa Verde National Park [illegible]

Windswept Sunrises and Glowing Mirages Form Classic Patterns under the Sky of Jeddah

Modern Man and Modesty

Women in Mecca, Homeward Bound, Leave a Contrast from Women's Dress

In Mecca's market place her red warm garment is the most popular piece. Modern fashion [illegible] rejected by [illegible]

On a Palace Roof at Al Khurj an Arizona Dust Farmer Holds a Conference on Saudi Arabian Land Problems

Bodyguards and Retainers Serving Yusuf Yasin, Acting Director Mahfouz and Regents and Mayors Attend King

Near Dhahran, Flowering Onions Recall Wartime Days when Food Was Scarce

American refinery workers planted these [illegible] when shipping was resumed. They were [illegible]

A Desert Dance near Al Khobar Pleases Middle Eastern Guests. Here

[illegible] Saudi Arabia [illegible]

now only a sea of sand, above which some stunted palm trees poke their shriveled heads.

Not to have found any inscriptions or other good relics in Qatif was a big disappointment.

To make matters worse, I woke up at Dhahran next morning to find myself locally infamous. The oil company's manager asked to see me, and when we met he asked in a worried tone, "Where is that elephant?"

"*Elephant!*" I repeated.

"Yes, the big elephant you found at Qatif."

My Arab companions, it developed, had disliked having no "news" for their friends. So they reported that I had found an immense stone elephant at Qatif which had been hauled away by our cars, to be crated and sent off to a distant land.

In the excitement the elephant grew ever greater, and with it indignation that such a national treasure should be removed from Saudi Arabia!

I weathered the storm, but have often regretted that in this particular case smoke was unaccompanied by any spark of fire.

The most interesting locality in al Hasa is that around Dhahran, the oil company's principal base. Here is a great bowllike rim-rock structure, and the outer slopes of this depression are speckled with thousands of the same sort of Bronze Age burial mounds as those on Bahrein Island.

Some of the mounds at Dhahran are encircled by a low rampart of gravel, presumably to prevent too close building of other mounds. One mound has a peculiar "avenue" leading from it: two parallel walls 60 feet in length, facing due north.

In places these conical tombs cluster in such profusion that they resemble a cemetery-city or a settlement of gigantic prairie dogs.

In Bahrein, as well as Hasa, the smaller mounds cover a stone cist; the larger ones contain at least one tomb chamber, made of stone blocks and occasionally plastered. Where there is a doorway, it faces southwest, W. 25° S., being the most frequent reading.

What can be the reason for this orientation? Did the mound builders come from that direction?

A possibility is that, when one of these tombs was constructed, its entrance was orientated toward the evening star. For astronomers calculate that the range in azimuth of the tomb entrances corresponds fairly well with that of Venus at sunset. And we have plenty of evidence that the worship of a mother-goddess, often identified with the planet Venus, is immeasurably old in this part of the world.

It was only after months of excavation, plus years of research, that I established the identity of the people buried within these Bronze Age mounds.

They were known as the Dilmunites; their king ruled over both Hasa and Bahrein Island. For at least 2,000 years, from 2,500 to 500 B. C., they fought and traded with Sumerians, Assyrians, and many others.

The Dilmunites never attained the high level of culture reached by the kingdoms of Mesopotamia. Except for one cuneiform inscription found on Bahrein, all our written sources for Dilmun come from the Babylonians and Assyrians.

These records, inscribed in wedge-shaped script on clay tablets or on stone, tell that Dilmun was a "holy land" to the Sumerians. To the island of Dilmun (Bahrein), Ziusudra, the Babylonian Noah, went to live after the Great Flood.

To this land, too, the demigod Gilgamesh journeyed to learn the secret of life from the wise Ziusudra, he who had been given eternal life "like unto the gods."

Dates Exported in Early Times

Other tablets actually suggest that Dilmun was an earlier home of the talented Sumerians, where they may have dwelt for a time before settling in the valleys of the Tigris and Euphrates.

Detective work among crumbling clay records has produced much other information about this very early Arabian kingdom.

For example, the chief export of the country was dates. They were evidently as highly esteemed as the amber colored, semitransparent fruit of modern Hasa, which is shipped to all parts of the Arab world.

We learn, too, that the special deities of Dilmun were the god Inzak and his consort Lakhamun; that about 2360 B. C. the famous Sargon of Akkad, having conquered Dilmun, carried away its ships as spoils; and also that even earlier the princes of Lagash sent southward to the Dilmunites such useful articles as wheat, cedarwood, cheese, and shelled barley—all sent in exchange for copper ore, which the venturesome sailors of Dilmun got from the country we call Oman.

During Assyrian times the kingdom of Dilmun became the object of a Hitlerlike "pressure-campaign," for the Assyrians were determined to make the country tributary to their empire. So in 689 B. C., when Sennacherib destroyed Babylon, he cunningly sent to Dilmun some of the brown dust that had been this fat-faned city.

Evidently the "present" had considerable

effect, for Assyrian records proclaim: "The Dilmunites looked upon it (the dust), and the terror of the fear of Ashur fell upon them and they brought their treasures. With their treasures they sent artisans, mustered from their land, carriers of the head pad, a copper chariot, copper tools, vessels of the workmanship of their land. . . ."

In the reign of Sennacherib's grandson, the luxurious and cultured Ashurbanipal (the Asnapper of Ezra 4:10), Dilmun is mentioned in a list of Assyria's provinces.

So it seems that eventually the Dilmunites had to yield to Assyria and "take the oath of allegiance by the great gods."

In the early Bahrein mounds, most of which probably date from the second millennium B. C., I found human skeletons, pottery, bronze weapons and tools, as well as ostrich-egg shells and parts of ivory boxes.

Many tomb chambers also contained ram bones of a ram or sheep, evidence of a blood sacrifice—a custom that Islam has never entirely uprooted in this region. Even today the figureheads of Bahrein boats are sometimes covered with the skin of a sheep or ram.

Home of Early Pirates

Where the Dilmunites originally came from remains a mystery. Yet there are reasons for believing that they drifted up from southwestern Arabia.

In their new home they must have taken rapidly to trade—and piracy. For at that time (perhaps not long after 3000 B. C.) there already sailed past this coast ships engaged in commerce between Mesopotamia and lands lying to the south: India, Oman, south Arabia, and places whose identity is still in doubt.

During navigation's infancy it was the custom to hug a shore line. The Iranian coast of the Gulf is so much more inhospitable than the Arabian one that even modern steamers prefer keeping near the western shore.

So the Dilmunite kingdom lay athwart the earliest sea-trading route of which we have any certain knowledge.

The goods carried northward included goats and copper ore from Oman, frankincense and myrrh from south Arabia, teakwood from India, also linen, diorite for statues, ivory, precious stones, and no doubt, "apes and peacocks."

Soon after my arrival at Dhahran, an American engineer told me that at Duwadami, in the very heart of Arabia, a "large arrowhead" had been dug up during construction of water tanks.

When he brought it forth, I recognized that he had made an exciting discovery, for it was a finely shaped hand ax of the Lower Paleolithic period (page 518). This weapon had been fashioned and used by some Acheulean man perhaps a hundred thousand years before Christ!

Link Between Africa and Palestine

It was a hint of the archeological treasures that must lie concealed in the center of Arabia, territory still completely unknown to prehistorians. For Arabia was a link between Africa and Palestine.

Before leaving for the Middle East I examined many aerial photographs of the Dhahran area with a magnifying glass. One place especially struck me as being a likely spot for finding traces of Stone Age man.

This was Jabal al Mudra, known as the "Shield of the North." This hill, whose summit is 410 feet above sea level, has a wide rock "bench" or terrace about a third of the way up. I suspected that its commanding position would have made it a natural port of call for early hunters.

Therefore, it was with a feeling of anticipation that I first climbed up to examine the rock bench. Here and there on its flat surface were small burial mounds; but what drew my instant attention were many bright flints lying on the ground between them. Recent rains had washed them clean.

I spent several days collecting flints and packing them away in small canvas sacks. They included scrapers, points, cores, and rejects, of various interesting techniques.

Some of these tools probably were made by the earliest mound builders, others seem to have been fashioned by true Stone Age men, but men far nearer to us in time than were the primitive Acheuleans who must have roamed central Arabia.

While I was gathering these artifacts, two young Bedouin brothers appeared out of nowhere. For a long while they watched me, much puzzled as to why anyone should stop, pick up a small stone, study it, and then place it in a bag.

Presently one of the boys knelt and selected a flint, which he offered me. But as it showed no working by man, I shook my head.

He kept gathering stones and offering them, until at last I took one, a true artifact, and put it in a bag. At that both boys broke into wild giggles and exclaimed, "Mashallah!" (As God wills!).

Pearling Camps of Ancient Days

They evidently thought it a fine guessing game: to see which stones the rude stranger would accept, and which he would refuse.

In this central district of Hasa I found many other things worthy of study. Near the coastline, east of the tumuli fields, are huge, elongated shell heaps, one over a hundred yards in length. The type of shell proves that near by were old fishing camps.

Medieval geographers—like along this shore pearl diving was a chief industry. It is the same today. Bahrein is known far and wide for the excellence of its pearls.

How ancient is the exploitation of the pearl oyster we cannot say, but it dates at least from the time of Alexander the Great [illegible] B.C.)

[illegible] 100 years later Pliny [illegible] Bahrein was "famous for the size number of its pearls."

A cuneiform [illegible] a pearl [illegible] brought [illegible] [illegible] was very early [illegible] and its gleaming [illegible], perhaps to set off the dark-brown [illegible] Sumerian beauties.

Who Built Bahrein's Nine-acre "Pearl Cabinet"?

[illegible] Mr. [illegible] found it [illegible] by the [illegible] Mr. [illegible] found it [illegible] by the [illegible]

North of the shell heaps, and about two miles inland, I came upon a fossil dune called Murrikibat by the Arabs. Like a petrified tree it lies there, a finely preserved monument of the late Pleistocene, when Europe still shivered in the Glacial period.

The "Tower of Silence"

This fossil dune is more than a mere curiosity, though it provides valuable information for geologists and other students of Arabia's remote past. For whereas today the drifting dunes of Hasa move towards the south-southeast, Murrikibat faces the southwest.

So when this dune was solidified, the winds were coming from the northeast, which means that then climatic conditions were radically different throughout Arabia.

On the sloping southwestern face of Murrikibat I found more than a score of curious pits. Some are about two feet by one foot, and eight inches deep; others resemble small coffins in size. Possibly Murrikibat once served as a *dakhma*, or "tower of silence."

Many followers of Zoroaster's creed from Iran dwelt hereabouts in the early centuries of our era. They may have exposed their dead in these lonely pits, leaving them to be devoured by vultures and wild dogs. Such was the custom of these folk, a custom

The King's Thirsty Camels Arch Long Necks and Fill Reserve Stomach Tanks

Before the oilmen came with their [illegible] rigs, the Bedouins depended on [illegible] wells. [illegible]

[illegible] in India by their Parsee [illegible].

[illegible] to the [illegible] line two miles north of [illegible], I next visited the little town of [illegible], notable for a [illegible] the [illegible] and [illegible] surrounded by water at high tide.

The fortress, [illegible] is believed to have been built by the Portuguese [illegible] the [illegible] years of the 16th century.

[illegible] out of [illegible] the Portuguese [illegible] the first modern European attempt to be established in Asia. The massive castles they [illegible] their [illegible] power [illegible] before the [illegible] of rebellious Arabs and [illegible] and [illegible] was swept away by a [illegible] Dutch and English sea power.

The "Most Successful" Pirate

[illegible] years at the beginning of the 19th century, Rahmah ibn Jabir, perhaps the most successful pirate

that ever infested any sea," made Dammam his lair.

While Rahma's ruling motive was fierce enmity towards the sheiks of Bahrein, he overlooked no likely prize. With five or six large vessels, each manned by two or three hundred lean rascals, he sallied forth to capture vessels from Kuwait, Basra, Muscat, and other ports.

A European who saw this pirate tells us that his figure "presented a meager trunk, with four lank members, all of them cut and hacked and pierced with wounds of sabers, spears, and bullets in every part."

In the last encounter at these quarters between his vessel and that of an opponent, Rahma, seeing that his men were losing, blew up the ship with his own hand and perished along with all his companions.

The principal seacoast town of Hasa is Qatif, which stands some 10 miles northwest of Dammam. I found ample evidence that ever since the Bronze Age the area lying between these two places has been the most thickly populated along the entire littoral.

The debris of centuries is mixed haphazardly, and I picked up many a piece of medieval pottery, as well as Chinese coins dating from the reigns of the Emperors Che Tsung (A.D. 1085-1100) and Li Tsung (A.D. 1224-64).

As early as the tenth century unwieldy Chinese junks appeared in these waters to exchange products of their distant land for pearls, dates, aromatics, and other commodities. At one time Chinese copper money became current in some ports of the Gulf.

Near Qatif I also found examples of the *trada*, or "long bit," a piece of copper having a small amount of nickel in it. The trada is shaped like a V, but with one prong straight and the other slightly curved at the tip. Although minted by one of the Carmathian princes, over 100 years before William the Conqueror set foot in England, it is still accepted in the shops of Hofuf, Hasa's capital.

Just west of Qatif's date-palm gardens stands a long line of wells. The water in them, artesian and warm (84° F.), flows eastward in subterranean channels, from which cylindrical shafts rise at intervals.

As the drifting dunes encroached on this area, the men of Qatif kept building up the shafts higher and higher (page 521). But now the sand has shifted or passed on, leaving some masonry columns towering nakedly in the air, like tall chimneys.

According to local tradition, which scientific study confirms, these wells once stood in the center of an immense tract of date palms. The Arabs also claim that the irrigation system was set up "long before the time of Islam." Since it is Iranian in style, the builder may well have been one of a series of Sassanian monarchs who once ruled over this province.

About A.D. 320 Shapur II, the first of them, brought an army across from Iran and conquered Hasa. He put to the sword many of its people, all but exterminating the leading tribes.

When tired of killing, this butcher ordered his troops to pierce the shoulders of the vanquished, tie them with ropes, and bring them in as prisoners. Because of this piece of cruelty, Shapur is known in Oriental history as *Dhul Aqtaf*, "Man of the Shoulders."

Since a few of the Qatif wells are as much as 160 feet in depth, American geologists are puzzled as to how they could have been constructed. For when the well shaft approached the porous Eocene strata, there must have been rapid seepage into the hole.

Fresh Water from Beneath the Sea

Inasmuch as the water flow is now several thousand barrels a day, it is considered amazing that the original diggers, with their crude equipment, managed to open up the porous formation to that extent. As usual, Arabs have a simple explanation: "Falling stars knocked holes in the ground, and Allah capped them up!"

Like Hasa, Bahrein Island has numerous wells, the most remarkable being submarine springs that exist just offshore. Fresh water courses up from beneath the sea in such abundance that the islanders may wade out and fill their jars with pure drinking water.

This wealth of fresh water in Hasa, a supply unparalleled in other parts of Arabia, is often commented on by ancient writers. It seems always to have been regarded reverently as a sacred gift of the gods.

The source of this water supply remained an enigma until very recently. It was even imagined by Arabs that a hole existed in the bottom of the Euphrates River, whence the water ran underground all the way to Hasa.

We know now that the source is in the Tuwaiq Mountains (Jabal-at-Tuwaiq), some 250 miles to the west of Qatif. Thence underground rivers flow into Hasa.

Somewhere amid the ruins spread around Qatif may be the remains of Billaga, a city located here by the geographer Ptolemy. And Pliny tells us that on Qatif bay, which he called Capers, lived two tribes known as the Gaulopes and Chateni. Qatif is thought to preserve the name of the latter tribe.

What these Gaulopes and Chateni were like,

[illegible]

Arabia's Skull Cracker of 10,000 B.C.

[illegible]

they captured [illegible] [illegible]

Captive Birds Are Children's Pets

[illegible]

[illegible] Qatar [illegible]

we can only guess. But judging from what [illegible]

[illegible] Gulf. It was [illegible]

[illegible] Qatar [illegible] Portuguese [illegible]

well as Jews were [illegible]

Qatar's [illegible]

While exploring the Qatar area, I heard rumors of a stone statue [illegible]

They were said to have been returned in a date garden.

Having obtained the local sheik's permission to dig for them, I set out one afternoon with a gang of diggers and assorted tools.

The sheik, small and bearded, joined our party. He tried to remember just where the objects had been hidden. He walked up and down between the tall date palms, studying the smooth sand and pondering. Finally he faced me, flung wide his arms, and announced, "Tawakkul 'al' Allah!" (Rely on God!).

He could not remember. The relics lay somewhere within a 50-yard radius, he thought. That was all he could say.

Anxiously I set my men to probing the sand roundabout with long metal surveying rods. But the shadows of late afternoon lengthened, and still our luck was bad. On an impulse I finally seized one of the metal rods, took a few paces at random, then plunged the shaft deep into clinging sand. At two feet it struck stone.

Stone Tablet Shows Early Spread of Christianity

With cries of "Mashallah! Mashallah!" my men hurried forward and commenced shoveling. Soon we had both buried objects above ground and standing upright (page 522).

The stone tablet contained a Sabaean epitaph: "Headstone and grave of Eliya the son of 'Ymr the son of Shasar of the family of SMM of the clan of DT, of the tribe of Shawdhah. 30."

The most interesting point about this inscription, which dates from the fifth or sixth century after Christ, is that the name Eliya (Elijah) suggests that the man was a Christian.

When Mohammed began his teaching in the seventh century of our era, Christianity had reached into many corners of Arabia.

The gospel was carried by missionaries out of Syria, Iran, and even Ethiopia. Wherever it bore fruit, Arabs abandoned their worship of the sun, moon, the planet Venus, or a host of other gods. There is a real possibility that if Mohammed had not been born, the Arabs would today be Christians.

Five Nestorian bishoprics had been established in Arabia by the seventh century, and one of them seems to have included Qatif. I saw a stone, found here some years ago, bearing a carved cross of seventh-century style.

The statue which we dug up is three feet in height. Both head and shoulders are lacking, probably having been knocked off by Wahabi "idol smashers," for a graven image has ever been taboo among strict Mohammedans.

The figure is thought to represent a pagan priest, assisted by a boy, performing a sacrifice. Its date must be around A. D. 200.

According to our friend the sheik, this statue was unearthed originally on Tarut, an island in Qatif bay. Arabs have found on Tarut statuettes of similar form, and also golden coins.

My next step was to pay a visit to Tarut Island, which on the Arabian map of Claudius Ptolemy, the Greco-Egyptian geographer who flourished under Hadrian, was labeled Tharo.

Two days before Christmas, accompanied by a geologist and several Arabs, I set out from Al Khobar in a native coastal boat and headed north for the island.

The *shamal*, or prevailing northwester, was blowing briskly, and the sky had grown overcast. So there was some danger of being caught by a storm. At times this shamal attains a velocity of more than 60 miles per hour, bringing with it great quantities of dust and sand out of the Nafud.

Even worse, in the view of navigators, is the unhealthy southeaster, or *qaus*, which is accompanied generally by rain and violent squalls. We know it has always been feared, for in the ruins of "Ur of the Chaldees" diggers have found a charm against "the evil of the South Wind."

The Scene of Sindbad's Voyages

As we approached the island, Tarut recalled scenes from the voyages of Sindbad the Sailor, for the steep walls of Darin, its principal town, cover most of the southern side and so give the impression of a city rising abruptly from the sea.

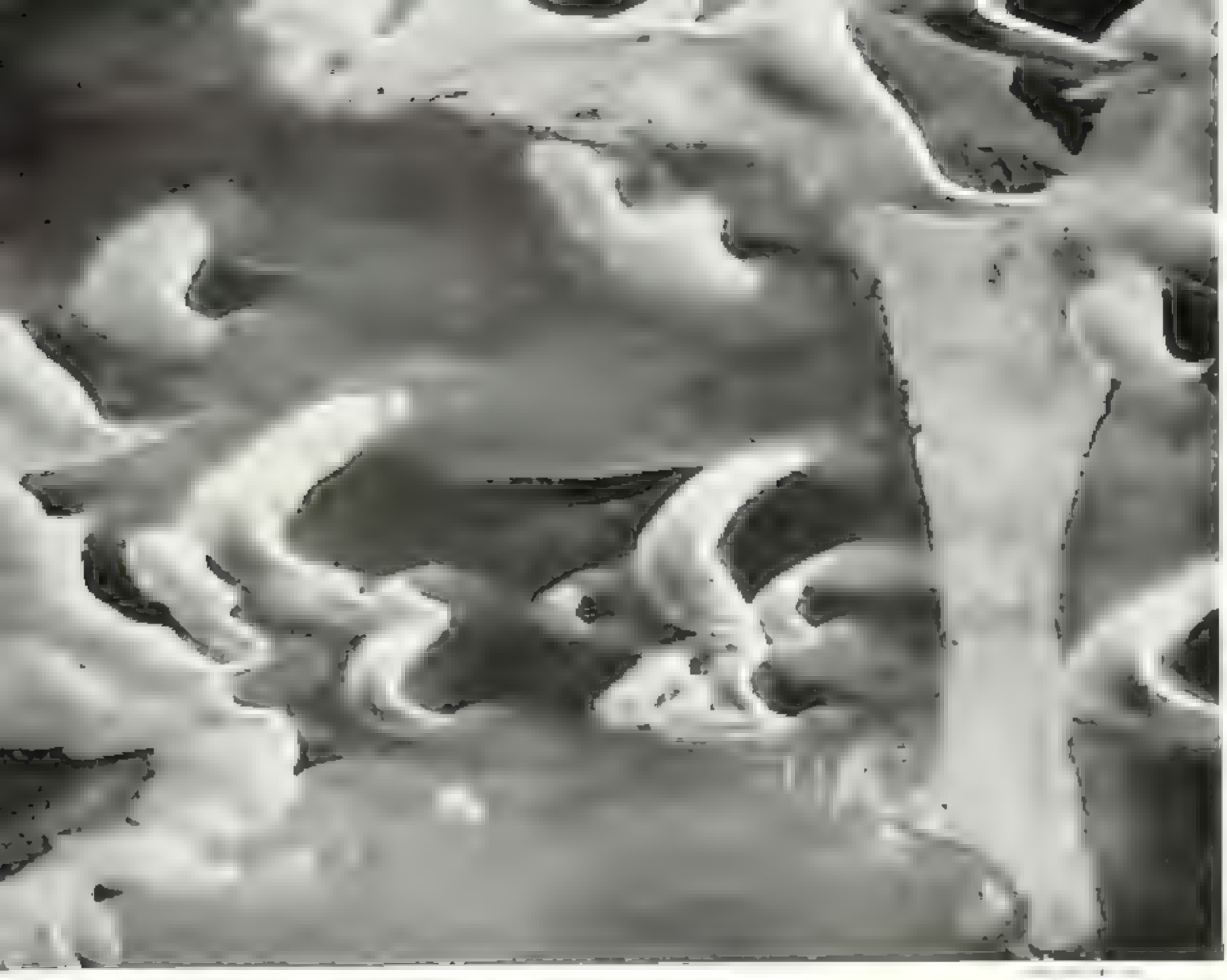
Tarut exudes an indefinable atmosphere of romance and mystery. This is true of nearly all the islands in the Gulf, and is notably reflected in the account of Sindbad's adventures.

On Tarut I could find no trace of an early temple, nor of any likely looking ruins. But the houses of present-day Darin apparently rest on the remains of earlier buildings.

Just north of the town is one place worth archeological attention: a field of small, crude, irregular mounds, which the natives say is an old burial place. Only excavation could lay bare its secrets.

In the Middle Ages this island grew famous for its stocks of musk and spices, imported from the south.

The modern islanders seem to subsist largely on fish, which from time immemorial has been the staple food of all peoples dwelling



Crescent-shaped Dunes in a Sea of Sand And Lake Breakers: A View from 10,000 Feet

[illegible] prevailing [illegible] convex side and sweeps sand up over the [illegible] degrees. In such fashion the dunes creep [illegible] Wind [illegible] such dunes in a light truck. [illegible] travel possible [illegible]

here along the coast of the Persian Gulf.

One of Alexander the Great's admirals while exploring the sea route from India to the Euphrates came upon some men who "had shaggy hair all over their [illegible] splitting the [illegible] clothing [illegible] thick skins of the [illegible] fish."

Island of the "Fisheaters"

[illegible] impressions reveal [illegible] of a great fish.

Alexander's [illegible] also [illegible] called Ichthyophagi (Fisheaters), whose diet consisted entirely of fish, which they caught by [illegible] and waiting for the ebbing tide [illegible] At Dammam town I saw [illegible] much the same pattern as those [illegible] by these fisheaters.

[illegible] I set out for the [illegible] passing on the way sparkling [illegible] caravans bound for various [illegible] in the northwest (Plate VI).

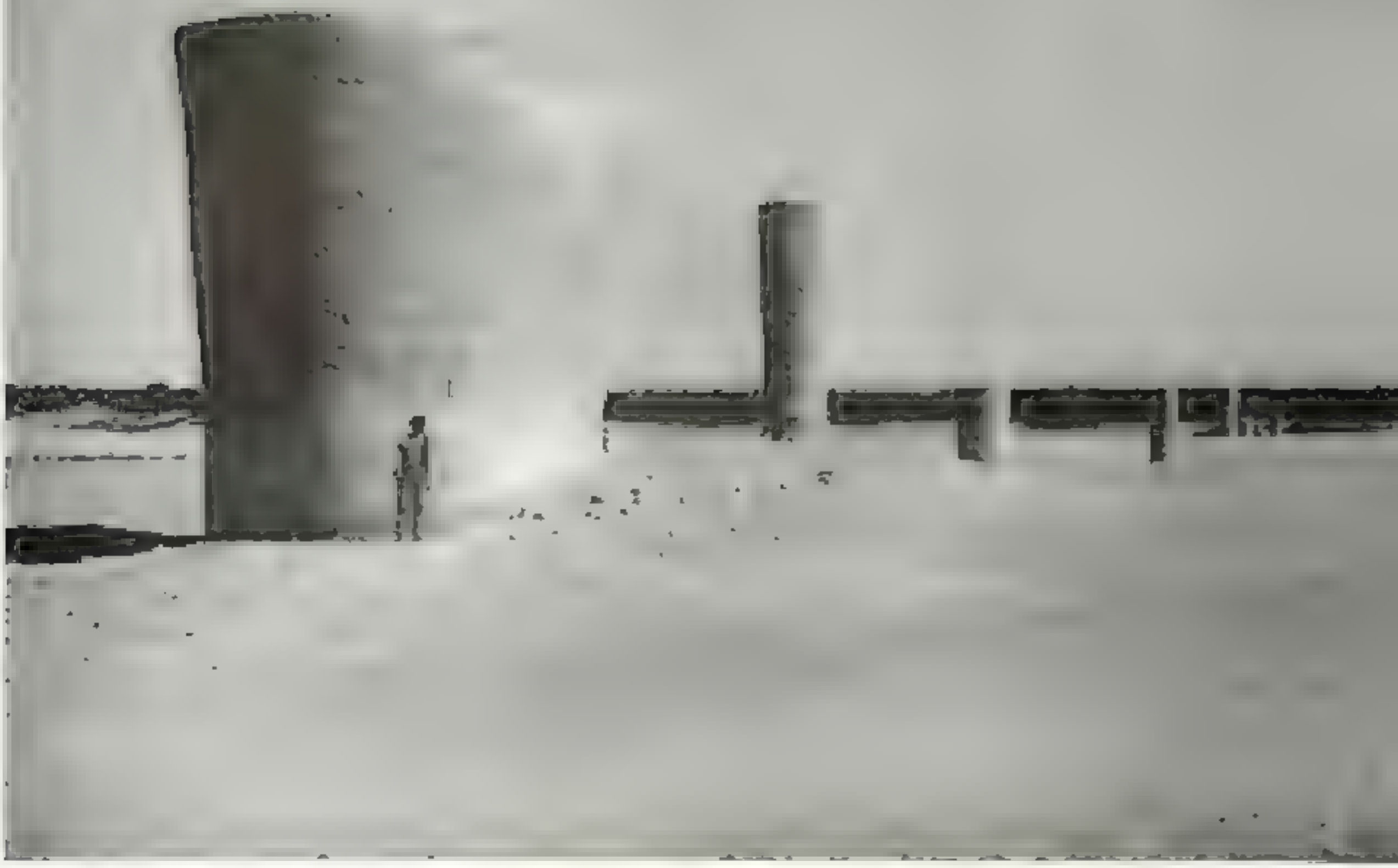
The land was barren, almost treeless, with very little of interest. But seven miles south of Jebail al Bahri, a small port [illegible] deserted town on the top of Jabal Bahr.

On the hilltop stand the ruins of oblong stone houses separated by streets, the whole laid out in orderly pattern. No wells exist in the hill or at its foot, nor are any reservoirs visible. Yet somehow its inhabitants must have provided themselves with water.

The place is strong defensively and may have withstood many a sudden attack by mounted raiders from the desert. Potsherds of green or blue glaze indicate that this hill town, whose name has long been forgotten, belonged to the Middle Ages.

From time to time I had heard talk of old cliff castles about 85 miles west of Jubail. With the usual pair of trucks I now set out in search of these promising ruins.

Our route westward ran through rolling



Interflow Group

Ghost Wells, Long Necks Exposed by Wind Erosion, Mark the Grave of an Oasis near Qurif

Once the [illegible] palm grove extended into this empty space. Then, as dunes encroached, wells were built ever higher. Receding, the sand wave left the columns bare and like [illegible]. There may be the trace of an underground river some 250 miles away. Qurif's irrigation system dates possibly from the Iranian conquest, some 1,600 years ago (page 517).

counter, so the journey was much like riding in a small motor launch over a seemingly endless series of waves.

An Early Caravan City

We stopped to refuel at Hinnat, one of the very few villages in this desolate region. Here and at the ruins-field of Thaj, about five miles southwest, an earlier visitor, [illegible] W. H. I. Shakespear, discovered in 1911 three interesting Sabaean inscriptions.

Shakespear, then British Political Agent at Kuwait, took a number of geographic [illegible] the interior, until in 1915 he was killed [illegible] skirmish on the borders of Nejd.

The place known as Thaj lay [illegible] the important caravan route running [illegible] the kingdom of Hira, in Mesopotamia, to Najran in south Arabia. In both places Christians were numerous; so many an early missionary must have stopped at Thaj while traveling through the peninsula.

From Hinnat we continued westward [illegible] tering the great interior Province of Nejd, "the heartland of the Arabs." Brown flat plain stretched away to the far horizon, and here and there mesas gave a touch of grandeur to the landscape, recalling the Apache country of the American Southwest.

First of the Cliff Castles

After crossing through a series of low enclosed basins called the Wadi al Miyah, we came to the easternmost escarpment and there spied the first cliff castle.

It was a fairly small settlement perched on top of an isolated butte. The mud-mortared [illegible] walls [illegible] it were built flush with [illegible]; it must have proved a tight and [illegible].

At one point a little limestone platform jutted out. In its center was a round portal hole through which only one man at a time [illegible] by means of a rope. In the [illegible] of the settlement a very deep well had been dug.

Long abandoned, this cliff castle may be a relic of the turbulent ninth century, when

Tombstone of an Elijah Tower in a Qatif Orchard, Suggests a Christian Burial

[illegible] ranged and fought in eastern Arabia.

Some centuries of the caliphate and possessed of a prophet of their own, the Carmathians gained control of [illegible] and strongholds on this side of Arabia. [illegible] finally sank [illegible] Mecca [illegible] Black Stone. [illegible] of Islam.

After leaving the oil [illegible] at a place [illegible] miles east of Qatif, [illegible] Siffa. [illegible] evening there sauntered into the tent an aged Arab, reputed to be one of the best and most trustworthy guides in the peninsula, a man who "knew Arabia from the Rub' al Khali to the Wadi Sirhan."

By lamplight we discussed the topography of the northern [illegible] whether any caves or notable ruins were known to him. But he assured me that the [illegible] were all that mattered.

I could not help thinking, though, that during his wanderings in the desert this man must have passed by many sites which some day will reveal a story to [illegible] and time he has seen [illegible] flint arrowheads discarded by primitive men whose very existence he has never suspected.

Inner Arabia may hold much for the paleontologist also. In Pliocene strata [illegible] west of Dammam Dome, oil geologists have discovered some [illegible] of a primitive form of [illegible] together with a few fragment of an early antelope. These fossils are perhaps 25 [illegible] years old.

Gold in Fiery Furnace in Summer

On the following day [illegible] Hofuf [illegible] the first [illegible] and around [illegible] these settlements were scattered flint [illegible] arrowheads together with quantities of potsherds.

Our route now led back to headquarters at Dhahran, and a few [illegible] later I returned by motor [illegible] Bahrain Island. For [illegible] was already [illegible] there was much further excavating to be done on Bahrain before [illegible] could be [illegible] into a new furnace.

During the [illegible] summer [illegible] temperatures [illegible] as high as [illegible] in the shade. If workmen lay down their [illegible] tools, they must bury them deep in the sand to prevent them from becoming too hot to handle.

So with many regrets I left Hofuf and its diverse antiquities [illegible] for a time only, not farewell. But as the Arabs [illegible] it, "Allahu 'Alim" (God is the knower).

The Idyllic Vale of Kashmir

By Volkmar Wentzel

With Illustrations from Photographs by the Author

LABORING hard, our outlone Army ambulance [illegible] Banihal Pass, raced through a tunnel, made a sharp turn, and suddenly before us spread a sight that made the pulses leap—the enchanted Vale of Kashmir in the lap of the snowy Himalayas.*

Veining the valley were poplar-bordered roads and silvery willow-lined watercourses. Above this vision reared the ermine peaks of the loftiest mountain range on earth—cool, aloof, immaculate contrast to the flies, dust, and sweltering heat of the Indian plain behind us.

Strife in Fertile Vale

Such was my first view of the Vale of Kashmir, in August, 1940. Fourteen months later this "Happy Valley" was to be racked by strife. Airborne Sikhs and Spitfire fighting planes of the Hindu-ruled Dominion of India were helping Kashmiri forces check advancing tribesmen from the Moslem Dominion of Pakistan (page 525).

Kashmir's fatal beauty and fertility had caused a tranc triangle, with the two new Dominions which had fallen heir to the British Empire of India contending for her favor.†

But peace reigned in the Vale of Kashmir when it burst upon our view with somewhat the breath-taking impact of an ice-cold shower bath.

Up from Delhi‡ we had come, my Hindu aide Ram Rau and I.

In the ex-ambulance which I had converted into a National Geographic Society survey car, we had followed the old route of the Moguls from India's ancient capital to their summer pleasure land (Plate I).

Those rulers had traveled in sumptuous style. On a leisurely trip from Delhi to Kashmir in 1664-65, the entourage of the Mogul Aurangzeb contained more than 300,000 people, and its transport consisted of at least 200,000 horses, mules, camels, oxen, and elephants.

In the mountains which rim the Vale of Kashmir there occurred a tremendous traffic accident as the Mogul's moving city made its elephantine way. Fifteen elephants fell over a cliff when unable to advance or turn around on the narrow road.

In contrast our only misfortune was a flat tire caused by an abandoned oxshoe which had been worn to razor sharpness. Over good roads we easily made the 600-mile trip from Delhi to Kashmir in three days rather than the several months consumed by Aurangzeb, who often stopped to hunt and otherwise enjoy himself on the way.

Beef Barred from Kashmir

As we crossed the border from the Punjab into Kashmir, turbaned customs officials stopped us briefly. Bringing in beef is prohibited, since the Hindu religion forbids the killing of cows. (The Maharaja is a Hindu, though most of his people are Moslems.) Even canned goods must be checked lest they contain a trace of the forbidden flesh.

All the way from Delhi the oppressive heat of India in the monsoon season had lain upon us like a smothering blanket, but as we climbed into the mountains of Kashmir it seemed as if a heavy load had been lifted from the soul.

Even the car seemed to take on new life as climbing through ever cooler air, we passed the temple spires of Jammu, the Maharaja's winter capital (map, page 526).

In this old city on the bank of the Tawi River, an electric power station, a silk factory, and the Prince of Wales College contrast with royal palaces of oriental splendor and with fort and museum buildings redolent of the past.

Where the first big glacial stream, the Chenab River, crossed the road, Ram and I stopped the car by common consent. Stripping, we luxuriated in the icy, tingling water.

From the river the road led upward in a series of horseshoe and hairpin turns to the summit of the Banihal Pass, 9,290 feet, dramatic gateway to the Vale of Kashmir.

On the crest we met our first typical Kashmiris—six men who had struggled up the steep

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "House-Boat Days in the Vale of Kashmir," by Florence H. Morden, October, 1939; "First Over the Roof of the World by Motor," by Maynard Owen Williams, March, 1942; "Harnessing the Water Dragons of Kashmir," by Maurice Pratt Dunlap, November, 1941; "On the World's Highest Plateaus," by Helmut de Terra, March, 1937.

† See "India—Yesterday, Today, and Tomorrow," by Lord Halifax, NATIONAL GEOGRAPHIC MAGAZINE, October, 1941.

‡ See, in the NATIONAL GEOGRAPHIC MAGAZINE: "New Delhi Grows Fast This Year," by Maynard Owen Williams, October, 1942; "India Mosaic," by Peter Muir and Frances Muir, April, 1940; "Delhi, Capital of a New Dominion," by Philips Talbot, November, 1947.

slopes from the Vale and had stopped to rest before resuming their long, slow trek to market. On their backs they carried heavy loads of dried apricots and other produce.

Forked Stick Serves as Seat

Each man had a forked stick which served the purpose of the portable seat sometimes carried by golf fans in the United States. Placing the unforked end on the ground, the wayfarer half sits, half leans on the fork, as if reluctant to sprawl on the ground lest he find it too hard to get up again.

All six, evidently Moslems, wore the tight Kashmiri cap, a long shirtlike garment, short pants, and sandals. They had the somewhat Semitic features of the Kashmiri, with dark hair and dark, sad eyes. Their skin, though brown and weather-beaten, was lighter than that of the southern Indians, and I remembered what Dr. François Bernier, French traveler, had written nearly 300 years before.

"The women especially are very handsome; and it is from this country that nearly every individual, when first admitted to the court of the Great Mogul, selects wives or concubines, that his children may be whiter than the Indians and pass for genuine Moguls."

Much earlier, Marco Polo had paid the Kashmiri women a somewhat similar compliment. "The men," he wrote, "are brown and lean, but the women, taking them as brunettes, are very handsome."*

Ram tried to talk with the men in Hindustani, but they seemed shy and soon resumed their toilsome trudge while we started down toward the carpet of green with its clusters of villages.

In a few minutes we were driving through a verdant countryside dotted with farmhouses and quaint little towns. In this Vale live about half of the State's 4,000,000 people, more than a mile above sea level.

Tradition Says Vale Was Once a Lake

Built largely of sun-baked brick, but with framework and trimming of wood, the houses were suggestive of Alpine chalets, an impression heightened by the snowy mountains beyond.

Wooden balconies hung from the house fronts like happy afterthoughts. The top story was usually left open for drying and storage. Roofs were thatched, and on many of them red peppers were drying. Ducks and geese waddled about the farmhouses and near the many streams.

Everywhere was running water, and I remembered the old Kashmiri legend that a great lake had once covered the Vale. The story goes that an aged saint miraculously split the mountain at Baramula, releasing the lake and transforming the Lake into fertile, well-watered land.

At a good-sized town called Anantnag or Islamabad, depending upon whether you happen to be talking to a Hindu or a Moslem, we paused for a cup of tea, an amenity easily obtained in Kashmir because of the number of Englishmen who come there from the plains of India on holiday or retire to spend their remaining days in this heaven of the Himalayas.

The tea and biscuits served us at a sunny table under the chinar trees tasted as if they had come from an English inn instead of a Kashmiri kitchen with an oven of clay.

Refreshed, we followed the widening Jhelum down the valley to Srinagar, summer capital of the Maharaja and beloved pleasure place of generations of Moguls. Today the city has a population of about 200,000.

At a hotel with no plumbing but plenty of servants, who brought a tin bathtub and buckets of hot water, I slept gratefully under blankets for the first time since I landed in India many weeks before.

A Red-bearded Genie Materializes

Next morning there came a knock on my door, and a tall, elderly, bearded Mohammedan in turban, baggy trousers, and shoes with upturned toes stood before me like a genie conjured forth by a twist of an *Arabian Nights* wishing ring.

His beard was hennaed a rich shade of red, a sign of deep religious devotion among the followers of Islam. Distinctive turban and handsome eaglelike features proclaimed him a Pathan, or Afghan, a people renowned for courage and martial spirit.

Gravely and politely this apparition introduced himself as Nur Mohammed, veteran of expeditions to Nanga Parbat and other Himalayan peaks. From a European acquaintance in Srinagar he had heard of my coming and wished to be my servant and guide.

He turned out to be far more than that, including cook, philosopher, and friend, all for 100 rupees a month—little more than a dollar a day.

I had heard so much about difficulties between Hindus and Mohammedans in India that I half expected trouble when Nur Mohammed and Ram Ras met. But my fears soon proved ungrounded. Each treated the other's faith with respect as we visited Mo-

* See "World's Greatest Overland Explorer," by J. R. Hildebrand, NATIONAL GEOGRAPHIC MAGAZINE, November, 1946.

[illegible] from Pix

Trenches Scar the "Happy Valley" as Indian Troops Defend Kashmir

Sikh soldiers [illegible] to stand [illegible] between [illegible] and Srinagar when tribesmen from Moslem Pakistan invaded [illegible] the State of Jammu and Kashmir [illegible]. [illegible] Hindustan [illegible] [illegible] to Srinagar [illegible] the Vale.

Mohammedan mosque and Hindu temple alike in the course of our picture-taking.

We must have made a strange-looking trio: the tall, bearded, red-turbaned Mohammedan, the slender, scholarly young Hindu who [illegible] a Sanskrit [illegible] and several books under his arm; and finally the American, [illegible] checkered Kashmiri [illegible] hiding [illegible].

The Kashmiri cap was a master stroke. I bought it to keep my hair from blowing into my eyes, but it gave the Kashmiris no end of amusement [illegible]. Apparently they had never before seen a sahib wearing one of their caps.

Gondola with Inner-spring Mattress

To see a cross section of life in Srinagar we boarded a shikara on the Jhelum River which winds [illegible] through the city [illegible] it reluctant to leave.

A characteristic institution of this Venice of India, the shikara [illegible] with a [illegible] and a romantic pleasure boat akin to the Venetian gondola. Many have inner-spring mattresses upon which the indolent may recline and [illegible] to the world by the [illegible] as they [illegible].

[illegible] *Honeymoon Special*, *Good Luck* [illegible] have [illegible] American [illegible]. Many are designed to appeal to visitors from the United States, for numerous GIs came to Kashmir during the war on leave [illegible] Himalayan [illegible].

Our canopy-covered inner-spring [illegible] glided smoothly down the Jhelum [illegible] with [illegible]-shaped [illegible] (Plate IX).

The winding street of water was alive with colorful traffic. [illegible] oversized [illegible] the Kashmiri equivalent of a [illegible] water pipe. In another [illegible] three or four Moslem girls were going to school.

[illegible] the wealthy and

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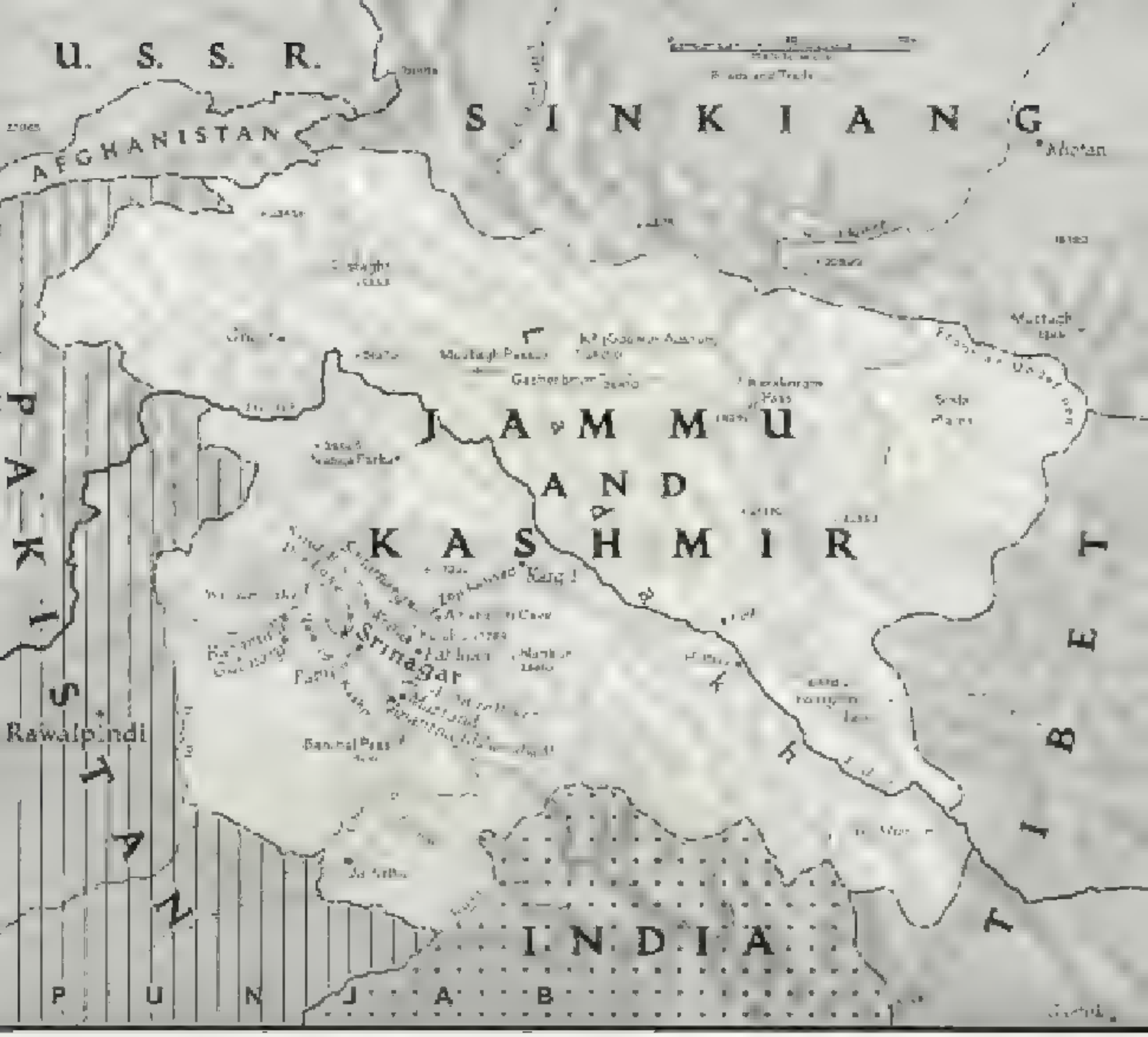
* See "[illegible]," by [illegible], National Geographic Magazine, [illegible]



Two New Dominions Clash over Kashmir, India's Northernmost State

Tribesmen from Modern Pakistan (Stage 1) fought their way into the Minnesota-size state of Jammu and Kashmir last October. To get armed help, its Hindu Maharaja announced its "provisional" accession to the Hindu-led Dominion of India (Stage 2), although the bulk of his people are Moslems. India's Prime Minister Jawaharlal Nehru, a Kashmiri Hindu, sent immediate airborne aid and sharp fighting followed. [illegible] the United Nations Security Council. The lofty Himalayan State lies close to Russian [illegible] Sinkiang. Its heart is the fertile Vale of Kashmir, along the Jhelum River between the mountains of Jammu and towering, lonely Gilgit and Ladakh.

the narrower, more graceful, but shabbier *dungas* on which native families live and die were moored along the shore or crawled like crabs from place to place under the patient urging of poles (Plates IV-V).

"All That Glitters Is Not Gold"

Along the banks women washed clothes, men unloaded wood or grain, and both sexes performed their ablutions.

From a balconied building overhanging the river came the monotonous drone of Mohammedan school boys learning the Koran by rote.

As we neared the heart of Srinagar's Old Town, a particularly conspicuous Hindu temple mirrored in the water caught my eye. Its gracefully tapering roof gleamed as if with gold!

Closer investigation showed that the temple had been roofed with tin from old kerosene cans. Rusting, these produced the golden glint.

In contrast, many of the Hindu temples which dot the Kashmir landscape have endured for centuries. In some, now ruined and abandoned, I noted traces of Greek architectural features, for ancient Greece began to make its arts and power felt in northern India in the time of Alexander the Great.*

* See "Greece—the Birthplace of Science and Free Speech," by Richard Stillwell, NATIONAL GEOGRAPHIC MAGAZINE, March, 1944, and "Afghanistan Makes Haste Slowly," by Maynard Owen Williams, December, 1931.

A Gujar Grame Sits by the Roadside, Selling "Jewels"

[illegible]

[illegible] Hindu women [illegible] red skirts [illegible] Muhammadan women [illegible] real Kashmiri beauty.

Wandering through the New Town, also [illegible] Two White Russians run a [illegible] *Dawood*. On another boulevard is a beauty shop. Permanent European residents and visitors meet at the Srinagar Club and [illegible] reminiscent of a [illegible] club and the [illegible] Anglo-Indian [illegible] looks as if it had been taken over [illegible] Lugard [illegible].

[illegible] Muslims as Bakhtawar [illegible] Mission. [illegible] Church Missionary Society's [illegible] Lucknow, [illegible] more than [illegible] [illegible] Muslim [illegible] site for a hospital [illegible] school [illegible] Bagh, since the buildings and walls [illegible] to be so placed as not to [illegible] the graves.

[illegible] Engineer [illegible]

himself to perform an emergency operation. The hospital ministers to hundreds of patients, many suffering from trachoma and other eye diseases.

Cheap John and Suffering Moses

Strange to Westerners are some of the names on the Kashmiri shops which line the bund along the Jhelum in New Town. The proprietors seem to go out of their way to depreciate themselves. Subhana the Worst is the name of one. Another calls himself Cheap John, but whether the adjective refers to John or his products I could not determine. A floating shop on a near-by houseboat is run by a worthy named Suffering Moses!

In the first shop I entered I was greeted in English by the Kashmiri proprietor.

"The crepe rubber for this pair of shoes came from America," he said, "and we're sending our son to New York next year to open an export business in leather goods."

Both he and his son had learned English in the Kashmiri public schools.

I bought a pair of the native sandals which are here particularly recommended for mountain climbing. But what, I wondered, keeps snow and cold from coming in at the open toes? The answer, it developed, is a pair of chamois socks.

In shop after shop I sought one of the famed Kashmir shawls of finest wool. My father bought a Paisley, an imitation of the Kashmir, long ago in an antique shop in New England—a thing of beauty, with reds, yellows, and greens glowing against a black background. But I soon discovered that one couldn't buy a genuine Kashmir shawl in its home country today for three times the price. Shawl weaving has virtually ceased.

One shop where I sought a shawl and found only a single torn, inferior specimen was also the place of business of a silversmith. As I entered, I saw him furtively hide some work he was doing. Later I saw what he had been making—"old" Grecian coins for sale to tourists!

Subhana the Worst, from my point of view might better have been named Subhana the Best. When I looked over the beautifully decorated articles of papier-mâché in his shop and inquired where and how they were made, he took me to Old Town by shikara.

There I gained a good insight into the industries and handicrafts which keep so many Kashmiri hands busy and strain so many Kashmiri eyes. Never shall I walk on a Kashmiri rug again without feeling I am walking on somebody's eyesight.

Although Srinagar has electric light, I saw little sign of it in the rickety buildings I visited to photograph the typical Kashmiri handicrafts—wood carving, *pashmina* wool weaving, rug making, metalworking, and the production of intricately decorated articles of papier-mâché.

Openings which hardly could be called windows admitted a minimum amount of light in summer, but were covered with oiled paper at the approach of winter. Few of the places I saw had glass windowpanes. The result was a general semidarkness in which the artisans squinted over their exacting work (Plate VI).

Typical was a papier-mâché products "factory," really a down-at-the-heel private house. This was a family industry and despite adverse conditions the workers, with cat hair brushes, turned out beautifully painted napkin rings, trays, lamps, boxes, candlesticks, large screens, and elaborate urns (Plate XVI).

In considerably more pleasant surroundings, an airy balcony above the Jhelum, wood carvers were plying their chisels. All employees here were men and boys who learn the art from their elders.

Child labor appeared to be common, and some of the lads were obviously only nine or ten years old (page 550).

In a primitive building devoted to pashmina weaving, most of the workers were old men. One turbaned old-timer in horn-rimmed eyeglasses explained that it takes a lifetime to master the art (page 546).

Soft, beautifully woven scarves and other articles are made on small hand looms from the superfine pashmina wool. This comes from the under fleece of the belly of goats raised in lofty, cold, snowy Ladakh, sometimes known as "Little Tibet" but actually a forbidding, seldom visited part of the State of Jammu and Kashmir.

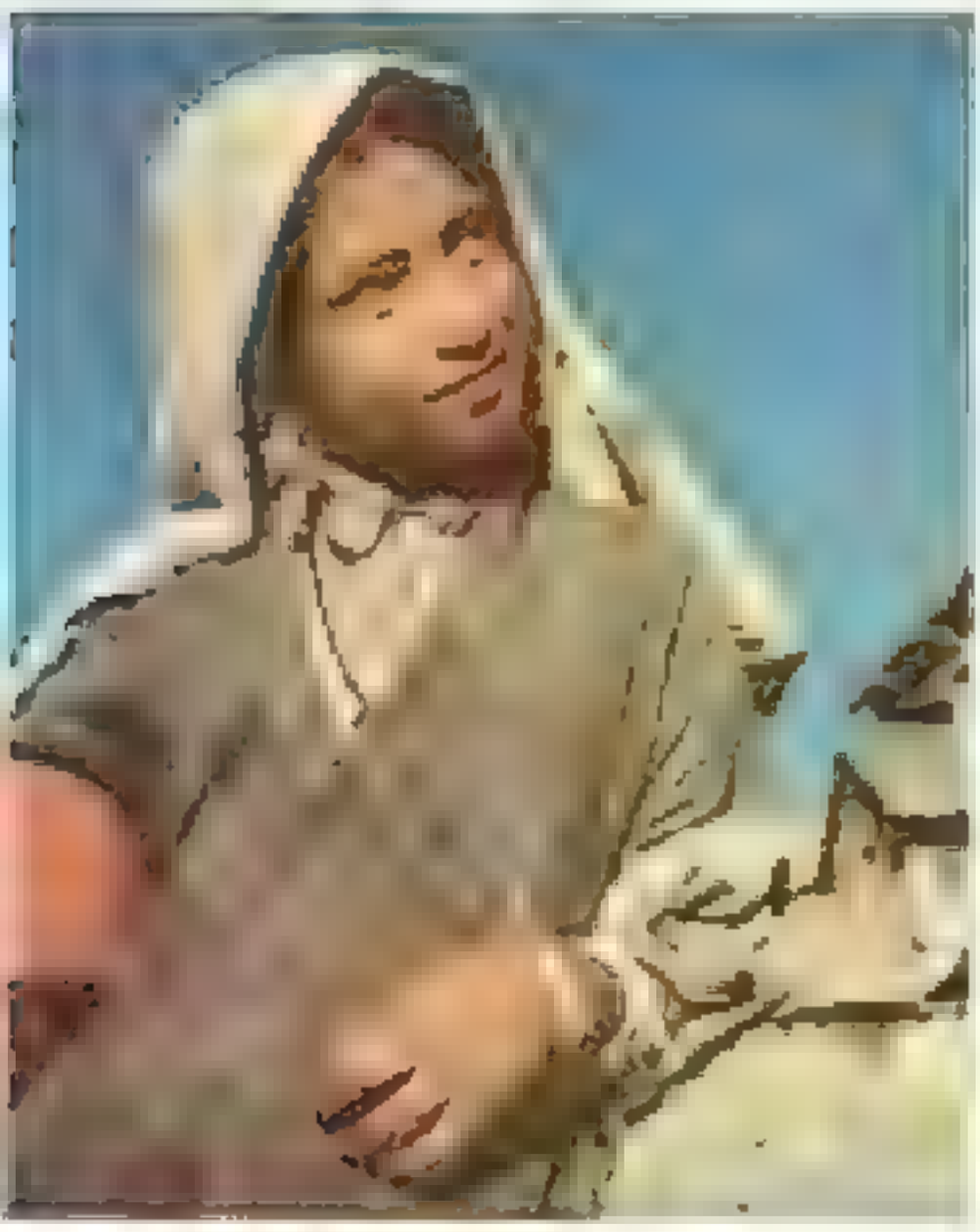
Workers Carry Their Own Heat

Winters in the Vale of Kashmir also are cold; yet these handicraft "factories" had no source of heat. Each worker carries his or her own heat, a small earthenware-lined wicker basket, called a *kangri*, in which burn charcoal embers. This brazier is snuggled as close to the body beneath the garments as possible.

Walking through the Old Town of Srinagar was like stepping back into medieval Europe: narrow streets, crowded and confined, with people pattering away as they did centuries ago, pariah dogs everywhere, and somebody throwing a bucket of waste from an upper story when you least expect it!

On the Road to Ladakh, Kashmir's "Little Tibet," by Photographer Lieutenant Vivian [illegible]

[illegible]



A Moslem Doctor's Daughter

[illegible]

Proud Father and Gloomy Son

[illegible]

In the Vale of Kashmir the Gold Forbidding Handsome Sucher in Earth's Paradise Dal Lake

La Guerre Contre Saddam Les Raisons de la Sainte Guerre

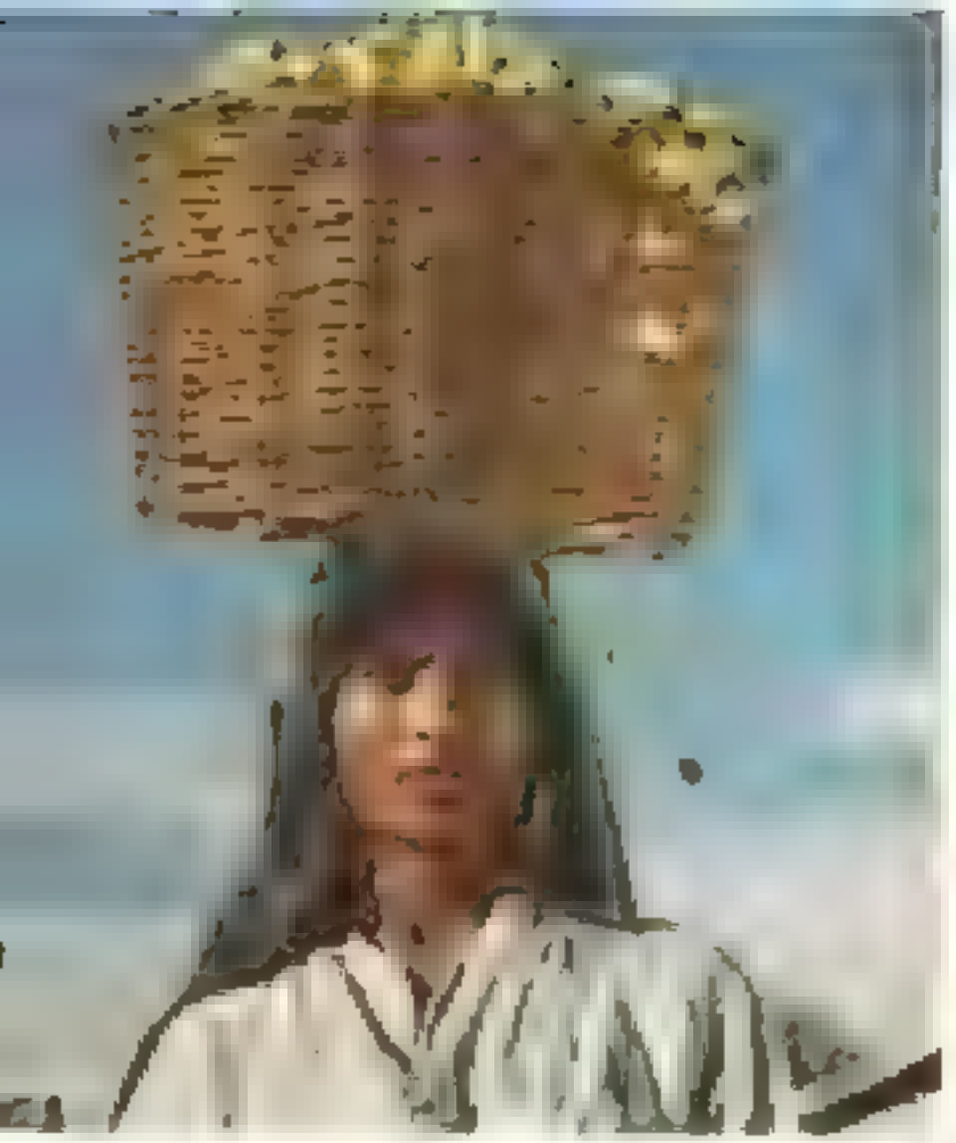
[illegible]

Main Street in Srinagar for Three Twisting Miles Is the Himalaya-fed Jhelum River

A [illegible] Srinagar [illegible]

Sorcerers Conquered, Illusions Dispelled: Kublai's Capital In Lake & Mediaeval Fairyland City

From Morning to Night, Strangely Continued Squat on a Floor Giving Their Eyesight to a Rug



Raw Silk Spills from Her Bonnet

Leaves, Worms, and Cocoons

Needleworkers Use Flying Gold Thread, Embroider Intricate Designs on Silks

Rousseau's Wedding and Home In His Barge, Which He Poles on the Seine

Heart-shaped Puddles Dance the Gondola *Grand Fantasia* Featuring Three English Passengers

All the Comforts of Home, Including a Dog *Bagatelle* Based on Kate Greenaway's Illustrations

Men at Pampur Engage in an Ageold Industry, the Collection of Pampur Saffron Blossoms to Make Yellow Dye and Spice

From a Crop of Quality Saffron, Sorters Hand-pick the Stigmas of 75,000 Flowers, These Stigmas in Dark Blossom

At Autumn Harvest, Farmers, Pickers, and Buyers Swarm to Pamper's Saffron Market

The Breeze from Saffron Gardens Is Heavy with a Delicious, Overpowering Scent

Strange Balconies Overhang the Thames as if Supported on Air; Timbers Resist from a Wood Carver's Windows, Center

Srinagar Needleworkers Wash Embroidered Felt Rugs in the Jhelum and Hang Them on the Ghats to Dry

[illegible]

Rug Weaves Spun Into a Pattern Handed Down from Generation to Generation

Imaginary Paint Designs So Intricate that Some Brushes Contain Only Three Hairs

On a relatively modern scale, however, is the silk factory in the city's outskirts. A wall encloses the factory buildings, which appear old but well-kept. Close by is a plantation of mulberry trees whose leaves are transformed into silk through the alchemy of silkworms.

In this factory I saw women workers for the first time in Kashmir. Dozens were squatting on their haunches around piles of cocoons, some of which were bright golden yellow, others almost white. The chattering of the women made a constant guttural babble, but they proved shy when asked to pose.

Some had earrings so heavy that they were suspended from the whole ear instead of just the lobe. They wore voluminous dresses of printed cotton cloth, but the long, flowing sleeves did not seem to interfere as their hands flew in sorting the cocoons.

Much silk for parachutes came from here—Kashmir's chief contribution to the war effort. Machines help turn the gossamer strands into skeins like hunks of beautiful hair, some golden and others platinum blond, and finally into silken cloth which may grace some maharaja's wife or a woman of fashion in America.

A Floating Six-room House

In almost incredible contrast to the teeming life of the Old Town is the beauty that blossoms along Dal Lake. Going from a dingy handicraft factory with oiled-paper windows to a luxurious houseboat and the glorious gardens of the Moguls was like emerging suddenly into another world.

Many houseboats on the Jhelum are owned by retired British civil servants and businessmen, who thus solve the problem presented by the fact that under Kashmiri law they cannot own real estate.

One which I visited proved to be a floating six-room house, complete with all the comforts of home, including a fireplace. Its owner, a gracious Swiss-English gentleman, had noticed the National Geographic Society car and promptly invited me to tea, explaining that he had been a member of The Society for many years.

Boarding a shikara on the Bund, I gave the "taxi" paddler the address of the boat, which was moored on the opposite bank of the river.

As we approached, a sliding door moved noiselessly open and I stepped directly into a living room fit for a maharaja.

Actually, my host and hostess explained the boat had belonged to a raja. When one of his wives died aboard, he decided that the boat was bad luck and sold it cheap. The beautifully paneled living room was now a happy wedding of East and West, with an English tea cozy and a Kashmiri samovar side by side (Plate IX).

Electricity was wired aboard, but water had to be carried from shore. Some of the native boatmen, incidentally, drink water from the river. Why it does not kill them I do not know.

In keeping with the leisurely pace of life on a Jhelum River houseboat is its "engine"—men with long punting poles who plant the poles firmly on the river bottom and push, walking slowly toward the stern along walkways on the boat's "topside."

Thus propelled, the floating homes occasionally get a change of scene, poking themselves slowly along the river and canals to Dal Lake like some deliberate, aquatic daddy longs.

At Dal Gate, which controls the flow of water, many houseboats are moored and about a hundred shikara boys lie in wait for tourist prey. One can go around this lake of delight either by boat or by road, and the pleasure gardens of the Mogals are now public parks, open to all. On the shore is the present Maharaja's palace, which sits back from the lake in walled seclusion.

From three sides snowy mountains look down on orchards of quince trees, fields of brilliant yellow mustard, bright flowers, and placid lake (Plate II). In July and August the lotus in bloom lends its delicate pink to the still waters. At sunset the scene is overpowering, with mountains, lake, and trees all melting together in a haze of purples and blues.

"Floating Fields" Sometimes Stolen

On the surface of the lake are "floating fields," aquatic plants on which earth and vegetable matter have accumulated, where melons and vegetables are grown. Occasionally complaint is heard that someone has stolen one of the fields, for it is entirely possible to tow them away with boats by night.

But the crowning glories of this lake, only five miles long and less than two miles wide, are the justly famous pleasure gardens, like miniature, highly formal Eden.

Great gardeners, the Moguls placed their personal versions of Paradise by the lake and made fullest use of the streams coming down from the snowy mountain backdrop. The clear, sweet life streams of the gardens flow through the pavilions and other buildings, pause in reflecting pools, then cascade down to other levels. In the days of the Moguls colored lamps glowed behind the waterfalls.

On tiny islands within the larger reflect

A Srinagar Craftsman in Horn-rim Glasses Sits at His Loom, Weaving a Wall Piece

[illegible]

ing, both the Moghuls and their heirs [illegible] amid fountains which [illegible] their own [illegible] system. [illegible] water [illegible] could [illegible] get the best of the [illegible].

All the gardens [illegible] only in [illegible]. The [illegible] and [illegible], with [illegible] trees and [illegible] and beds [illegible] flowers. The [illegible] Moghuls [illegible] as well [illegible].

[illegible] most appealing [illegible] which draws its sustenance from a spring on a slope above the lake. It was [illegible] by the Moghul emperor Shah Jahan.

[illegible] Bagh [illegible] will [illegible] its name, meaning "Garden of Gladness."

But the most famous of all is the Shalimar Bagh, [illegible] Jahangir for his beloved wife, the famous Nur Mahal, "Light of the Palace." It has a magnificent black-marble pavilion, built later by Shah Jahan. Part of this garden was reserved for the court [illegible] and was called [illegible]. [illegible]

"Where Are You Now?"

Here, strangely enough, I had my first and only [illegible] a girl worthy of the poets' praise of the beauty of Kashmiri women. It was Sunday and the garden was full of people. [illegible] I found [illegible] in the [illegible] of the [illegible] eyes I had ever seen.

The owner of the eyes was a [illegible] Moslem girl, with a [illegible] on her shoulders. Long lashes [illegible]

With Sardonic Eyes a Sound Regards His White Buffalo Coat

[illegible]

[illegible]

Never more appropriate seemed Laurence Hope's [illegible], with its sad note of [illegible]

> [illegible]
> [illegible]
> [illegible]
>
> [illegible]

[illegible]

[illegible]

Hitchhikers, Even in Kashmir

Bountiful crops [illegible] between the mountains and the lake.

[illegible] Trash by car, but [illegible] Women carried [illegible] they were trying to hitchhike [illegible] without [illegible]

When I [illegible] to [illegible] prompt [illegible]

[illegible]

Doctor's Large Needle Brings a Wince of Pain, but It's Better than Cholera

[illegible]

[illegible]

[illegible]

extracting the flower parts which yield saffron, much in demand as a condiment and as a yellow pigment for Hindu forehead marks (Plates X-XIII).

On another trip we followed the Jhelum downstream from Srinagar to the point where it widens into Wular Lake. Although only about 6 by 15 miles, this is the largest permanent natural fresh-water lake in India. Seasonal floods expand it considerably. Shallow and fringed with reedy marshes, it seems a remnant of the great lake which legend says once covered the Vale of Kashmir (page 524).

Waterfowl abound, and here the Maharaja and his friends shot hundreds of ducks. I saw the score sheet of one such hunt. The Maharaja bagged the most, and the scores of the others descended strictly in the order of their rank.

In a pasture on the outskirts of Srinagar Mohammedans were celebrating a religious festival. The celebration had all the gaiety of a county fair in the United States, except that at the hour for prayer all the fun would suddenly stop, the crowd would form into two large kneeling groups, and all would bow low to the ground. Then the festivities would start again.

Here I saw a traveling beauty shop—a man with a stick of antimony who gave the celebrants, of either sex, a dab or two of dark shadow under each eye for a couple of copper. Perfume was heavy on the air. All wore their newest and best clothes, and women, and children, too, were loaded with elaborate jewelry (Plate I).

On our next trip we headed for the beckoning mountains. Driving east from Srinagar to Pahlgam, we hit the trail on foot to Aru, and there hired ponies and camping equipment for the trek to Kolahoi Glacier, on the slopes of the Matterhorn like mountain of the same name.

Striped and Dotted Sheep

We were not alone, for the people of India flock to such resorts, just as New Yorkers go vacation hie to the Catskills and Adirondacks. The little wayfarers' cabin at Aru, where we spent the first night, was packed with Sikhs, Hindus, Mohammedans, and English and suddenly I heard the unmistakable accents of another American. He proved to be a teacher from Forman Christian College in Lahore, who was taking his Indian students on a tour.

As we rode up the pretty alpine valleys on our hired ponies, we sighted the strangest-looking sheep I had ever seen. Broad bands and dots of red, or red and blue, made them look like circus freaks. These marks, however, were merely the painted brands applied by the Chopans, or shepherds, a nomadic mountain people.

Also at high altitudes live two other tribes of herdsmen, the Gujars and Bakarwals. Those I saw were sturdy people, shy but frank, honest, and hospitable. From them the inhabitants of the Vale get much of their milk and wool (pages 527 and 547).

Some of the Bakarwals served us cheese, using a leaf as a dish. It tasted good, somewhat like cottage cheese. The men were bearded and patriarchal in appearance. The women were large-featured and not uncomely, with braided hair, little round caps, and silver jewelry. They were wholly different from the people I had seen thus far in Kashmir.

Above timber line we ran into rain and snow, and by the time we crossed the glacier we were all soaking wet and panting from the altitude. In the big ice cave at the glacier's base we partially regained our breath. I think we were all glad when a broken strap on one of my Kashmiri sandals gave a good excuse for not going farther.

Leaving the Vale by the Back Door

Among the beauties of the Kashmir mountains are the lofty *margs*, or grassy alpine meadows. At Gulmarg, a popular resort, part of the marg has been transformed into a golf course. So arresting are the peaks in the back ground that it must be almost impossible to keep one's eye on the ball.

The lofty snow-covered ranges in the distance loomed like a challenge. My car was temporarily out of commission with a shredded fan belt. Why not climb farther into the Himalayas, where no wheels could move, anyway, and trek into "Little Tibet"—Ladakh, as different from the fruitful Vale as if they were on two different planets?

Thus it came about that I left the Vale by its back, or eastern, door.

A vulcanizing job on our fan belt carried us the 40 miles from Srinagar to Sonamarg, "Meadow of Gold," at more than 8,500 feet, which was as far as the motor road went. There we loaded ourselves and equipment on six ponies.

There, too, we met our first Ladakhis, Tibetans who might have stepped straight out of the pages of *Lost Horizon*. They wore felt boots, homespun woolen robes, and little hats which looked as if they had been thrown on their heads from a distance (Plate I).

It was bitter cold and our hands were numb as we strapped the loads on the ponies next morning. The first rays of the sun had not

Kashmir Craftsmen Who Never Heard of Power Saws and Lathes, Do All Work by Hand

With primitive tools the man and his apprentice create the most delicate designs, many of them in [illegible] and hardwood [illegible]

[illegible] valley, but they played on the high, snow-covered peaks, outlining them in delicate pastel shades.

Our ponies led the way through fields and forests covered with hoarfrost, upon which the sun soon shimmered with an effect like [illegible]

[illegible]

Amarnath Cave Sacred to Siva

[illegible] in this direction [illegible] Himalayan [illegible] the pass [illegible] surrounding peaks [illegible]

[illegible] looking south [illegible]

[illegible] is the cave of Amarnath, the secondary abode of our Lord Siva, the Destroyer and Re-creator. Since [illegible] of Hindu pilgrims have wended their way annually to worship [illegible] the Mecca of the Mohammedans."

With our hearts pumping heavily we toiled upward. The road now was a narrow path which clung to a precarious mountainside. I kept for a few pretty silver lupines, all vegetation had [illegible]

In this dead world we looked like [illegible] who had been [illegible] on the moon or on some habitable planet!

This other [illegible] we [illegible] wizened old character in a long drive coat of homespun wool. Over this hung one long pigtail and a series of cloth amulets strung around his neck. A floppy cap was jauntily perched on his head. He gave us a cheerful [illegible]

Shortly before we reached the summit we [illegible] for [illegible] Siva. [illegible] wound it was [illegible]

What a prize this Vale of Kashmir must [illegible] Mogul leaders [illegible] the cold [illegible] Vale. And no wonder their [illegible] the Moguls, [illegible] earthly paradise in this air-conditioned Vale!

* See "Pilgrimage to Amarnath Himalayas" [illegible] Geographic Society's Cumulative Index [illegible]

Down Mark Twain's River on a Raft

By Rex E. Hieronymus

A TRIP down the Mississippi River on a homemade raft is one of boyhood's most cherished dreams. This is the story of two boys whose fathers turned that dream into 1,400 miles of reality.

I might as well confess right now that we two fathers, Tom Roth and I, felt the lure of the big river as strongly as our sons. We shared with Tom's 12-year-old Tommy and my 15-year-old Dick the conviction that a vagabond river journey was the peak of adventure (page 554).

We would ride the river on a raft. Did not those prototypes of all adventurous Mississippi travelers, Tom Sawyer and Huck Finn, sail a raft? All right, we four would build our own craft and fare forth.

If we ever need concrete reminder of our adventure, Tommy has the 12-inch bronze propeller which pushed our floating magic carpet down the river from Chicago to New Orleans. And Dick has the brass-mounted mahogany steering wheel he and I made in a basement work-hogs to guide our craft on the long voyage (map, page 553).

The boys' confidence in our ability to design and build the raft and then navigate her from Chicago to New Orleans was a challenge.

For a time war delayed us, but shortly after V J Day we began work on designs for the raft and plans for the trip, and undertook serious study of charts and pilot rules.

Shipbuilding in a Basement

Early in January, 1946, we started actual construction of the raft, dubbed the *Mecanco* by the boys, short for their ambitious name for our outfit—the Mississippi Exploration and Navigation Company!

For six months Tom Roth's basement in suburban Western Springs, Illinois, was a beehive of cutting, fitting, threading, tapping, and painting, until one evening in early June we sat back on our heels and surveyed with pride the unorthodox conveyance that was to be our home on the month-long journey.

In licensing us, the Coast Guard dignified the raft as a "power-driven open boat, more than 15 and less than 26 feet long," and issued us the number 39-E-344, authorizing us to traverse the inland waterways and entitling us to service through locks, the raising or swinging of interfering bridges, all Coast Guard [illegible] but their [illegible] Luggage fell far short of conveying any picture of what the *Mecanco* was really like.

Properly she could be described as a double-pontoon catamaran raft, powered by an outboard motor. The frame and deck were constructed on two parallel pontoon floats, eight feet apart (page 557). Each pontoon consisted of five 55-gallon steel oil drums, the front and rear drum of each side assembly being provided with a welded cone of heavier steel to streamline the floats and provide additional buoyancy.

The drums were not welded solidly together, but were fastened rigidly into wood and steel saddles to which the tanks were secured by steel straps. Total buoyancy of the pontoons was 5,028 pounds.

Our power plant was a 22-horsepower outboard motor mounted toward the rear, midway between the two pontoons; for steering we set a conventional wheel forward.

We secured an olive-drab tent to the deck and stowed a duffel locker and two cots inside to provide three bunks; the fourth was atop the locker.

Pontoons Carry Fuel and Water

Fuel was carried in one of the 55-gallon drums, water for washing, etc., in the corresponding drum on the opposite side. Drinking water we carried in containers on deck.

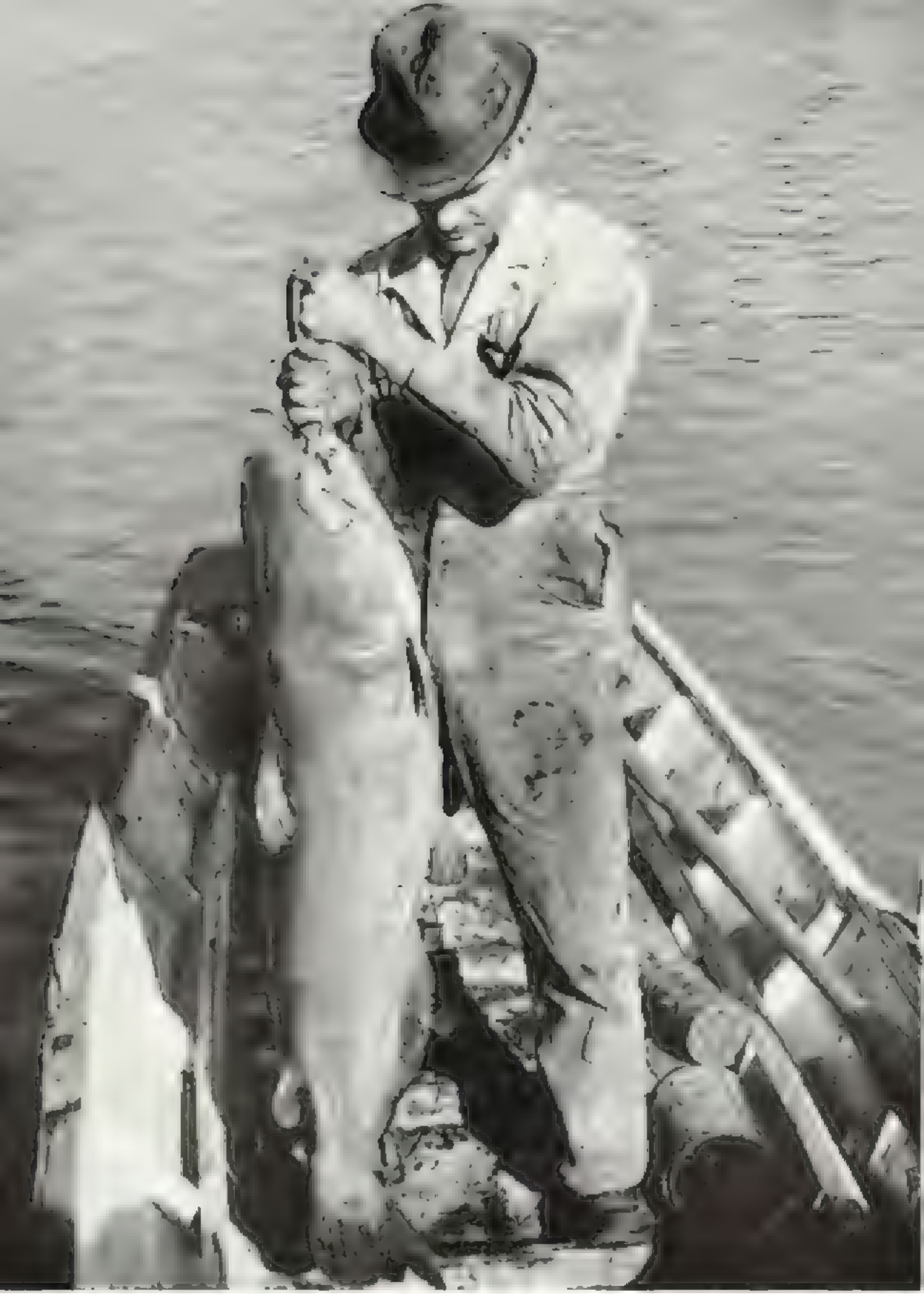
For cooking while under way we used a special double-walled, steel oven-stove, heated by exhaust gas from the motor. We cooked on a gasoline camp stove or over a campfire when we were ashore.

The *Mecanco* was 10 feet wide by 21 feet long, her deck space 10 by 15 feet. Clearance, including the flag mast, was 11 feet 3 inches. She was neatly and durably painted, pontoons and below-deck gear in aluminum and green and deck and superstructure battleship gray with a gay trim of Chinese red.

Tom and I were confident our raft was sufficiently shipshape and river-worthy to assure our primary aim: the construction of a craft that was in keeping with the adventurous spirit of our trip, but one in which our boys would not be exposed to needless danger or discomfort.

The *Mecanco* Sets Sail

On the cool June morning when we proudly launched the raft in the canal near Summit, Illinois, our assurance was justified. Easily she floated, to the astonishment of bystanders who audibly doubted that anything that peculiar looking *would* float.



Old Man River Gives Up a 44-pound, 50-pound Mississippi Channel Catfish Off St. Louis

In the early afternoon of June 29, fully provisioned and shipshape, the raft was ready to go. Tom R th, Tommy Dick, and I, with a friend who was going along about 100 miles "just for the ride," waved to family and friends gathered to bid us bon voyage.

With Dick at the helm and Tommy breaking out the flag, we dropped slowly down the canal. New Orleans lay 1,400 miles, a whole month, ahead.

Boys Anxious to Steer

Quickly our days shook down into a routine of navigation, cooking, making up for the night, etc. At first the boys were eager to do all the steering, alternating every half-hour.

Later the novelty wore off, and we rotated duties, establishing one-hour shifts for the three duty positions—helmsman, navigator and chief engineer—with the fourth man off duty, free to watch the passing shores or snooze in the tent shade (page 504).

We used the motor always when under way, except during lunch and while fishing for catfish. Then we would drift along, free to enjoy food and companionship, giving only "lookout" attention to navigation.

Though equipped with lights and signals for sailing at night in case of emergency, we [illegible] only during daylight hours; we [illegible] to miss anything interesting by sailing past it in the dark.

Evenings we swam, and after supper the galley was the scene of many a "jam" session, during which Tom and I became really acquainted with our sons in an intimacy for which we had seemed never to have enough time in the hubbub of city life.

We shared the indescribable beauty of dusk and nightfall in cove or bayou where, tied up off the sailing channel for the night, we went to sleep to the cries of whippoorwills and hoot owls (page 502).

There was the awakening call of the cardinals at dawn, when the dew on our blankets and on the whole raft was heavy as from a gentle rain. Then a dip in the river lasted until the delicious smell of wood smoke, mingled with the aroma of bacon and eggs and coffee, got us out of the water and into our clothes in a hurry.

On down the Illinois River we sailed, quite by name—Peoria, Havana, Beardstown, Meredosia. At 1:10 p. m. on July 5 we cleared Mason Island and Island No. 526 and sailed out onto the broad bosom of the Mississippi!

That night we tied up at Grafton, Illinois (page 555), planning to lock the big river on the morrow. We were six days, 313 miles from home, right on the button at the

Chicago's Huck Finn and Tom Sawyer Join Their Fathers on a Raft Adventure

[illegible]

[illegible] was an interesting sight: for a distance of [illegible] we could see huge blotches [illegible] water in the Mississippi [illegible] the two rivers [illegible]

Room for All Vessels

We [illegible] at the [illegible] Mississippi Lock and Dam No. 26 at Alton, Illinois. We [illegible] the lock [illegible]

[illegible] boat as and paid to the [illegible] for the [illegible] feet [illegible].

While the lock chamber was empty [illegible] rafts the size of the *Mecano*. We really rattle around!

We had been warned about the tricky current near the Chain of Rocks Bridge above St. Louis. Tommy was at the helm as we approached it, but looking on the chart [illegible]

[illegible] Tommy brought the *Mecano* through the eddies like a veteran, and soon we were anchored off Market Street at St. Louis.

[illegible]

[illegible]

Where the Illinois River Joins the Main Stream the Mississippi Is Still Clear Water

[illegible]

St. Louis friends came aboard to visit and [illegible] took us ashore for a [illegible] night. That night aboard the showboat *Goldenrod* we saw a performance of "The Drunkard," that perennial thriller of [illegible] audiences.

Cairo, Illinois, and Cape Girardeau, Missouri, welcomed us [illegible] on succeeding nights. Down we dropped toward Cairo, Illinois, where the Ohio joins the Mississippi at the beginning of what is called the Lower Mississippi River. At that point we would be 880 miles from home.

The current [illegible] compared to the upper river, [illegible] rate of eight miles an hour.

"Sharks," said Laurie, "there's [illegible] to it. I thought there would be [illegible] water [illegible]."

"Don't worry, son," said his father. "We [illegible] to New Orleans yet."

The river was wider than [illegible] water. [illegible] below St. Louis where the river is [illegible] wide and the [illegible] line of the [illegible] channel [illegible].

"Hey, Bess," he asked, [illegible]

According to charts there were [illegible] water, but with the river at [illegible] we [illegible] (Laugh) Our [illegible] through the [illegible] and [illegible].

Suddenly we felt [illegible] sand [illegible] "We were aground!"

For [illegible] middle of the Mississippi River [illegible].

Dick and Tommy Nail Down the Deck. Lucky Hunters Strike Strange Adventure Cruise

[illegible]

[illegible] I [illegible] I had been [illegible]

[illegible] you [illegible] right [illegible]

[illegible] short [illegible]

Tom and I [illegible] the turbid water [illegible] the sand bottom [illegible] refused to [illegible] weight, the [illegible]

[illegible] "[illegible] explosion. [illegible] wide and [illegible]

Downstream ahead of us the [illegible] we should have [illegible] back [illegible] current. The [illegible] would clear efforts [illegible] us [illegible] way we could get off the bar [illegible] the raft.

River Falling 5 Inches in 24 Hours

[illegible] River [illegible] 5 inches [illegible] 24 hours [illegible] *Mizzou* about before night.

The situation calls for [illegible] "Coming up," Tommy [illegible]

[illegible] I [illegible] [illegible] but [illegible] water.

[illegible] we decided [illegible] that would float and not be [illegible] water, and [illegible]

[illegible] emptied the ice locker plugged [illegible] it afloat, and then put [illegible] smaller [illegible] the two [illegible] and the old Dodge [illegible] Nevada [illegible] their young help fighting [illegible]

[illegible] the [illegible] on the bottom we [illegible] each corner of the raft. With [illegible] and a pike pole we cleared the sand from around the propeller [illegible] at a groove upstream for [illegible]

[illegible] I had [illegible] of the two [illegible] Dick and Tommy [illegible] on the bottom.

Built Catamaran-fashion, *Menace* Straddles Two Floats the Size of One-man Submarines

[illegible]

[illegible]

4-Man Power Moves the *Menace*

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Mark Twain described in *Life on the Mississippi* [illegible]

[illegible]

[illegible]

[illegible]

Menace Rides Out a Storm

[illegible]

[illegible]

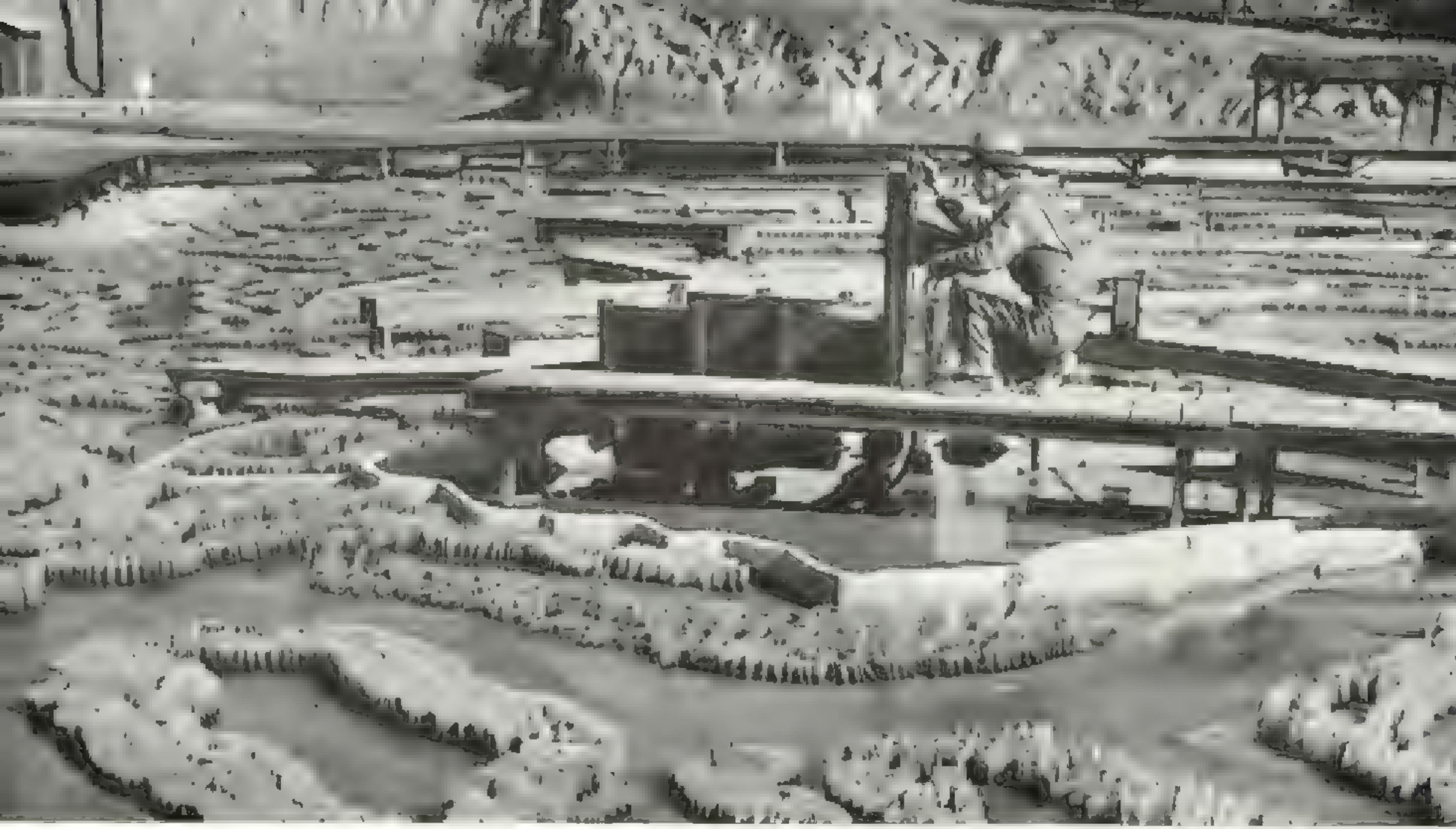
[illegible]

Zoppini Post St. Louis, Meanco Shows How She Averages 52 Miles a Day. For Iron Workday Circus, Farmers Learn to Understand Sons

Near Baton Rouge Bridge, Sprague Churns Up a Wake Such as That Which Almost Wrecked Barges

A Towboat Shows Its Barges Beneath Parallel Highway and Railroad Bridges Linking Memphis (Right) to Arkansas

She's Wrinkling Black Dust Stains the Snow — A Moment Later the Tornado Lashed the Village of Wessex



On a Miniature Mississippi, Whose Waters Flow Through Screen Mesh Representing Flooded Wooddenes, an Engineer Reads a Gauge

Moored Moors to a Dead Tree: the Boys Finish Breakfast. School Seems Far Away

[illegible] in the Homes River backwater, safe from the peril of [illegible]

[illegible] the Mississippi [illegible] Street [illegible] The Mississippi pushed so hard that her propeller was out of the water [illegible] racing [illegible] a chance [illegible]

Suddenly we realized that we were [illegible] headway against the combined forces of the wind [illegible] and current and were in danger of being swept into the levee. Tom at the wheel [illegible] the levee.

We [illegible] the [illegible] engine it would hold us against the strong drag. It seemed very dull enough to enable Tom at the wheel [illegible] Mississippi.

We were [illegible] 20 yards off the rock [illegible] when [illegible] from the [illegible] Relentlessly we were being pushed into a pile-up on the rocks.

The waves were breaking so high on the [illegible] that we [illegible] the terrapins. We [illegible] back by the waves and by [illegible] the [illegible].

Tom and I, trying to decide what to do, [illegible] to be heard above the shrieking wind. Tom ducked out from under the [illegible] and [illegible] a [illegible] grip on the wheel [illegible] to hold her [illegible].

We [illegible] [illegible] to kill [illegible] when we [illegible] or no [illegible] if we [illegible] the foot of the levee.

Beaching the Raft

Five yards off the [illegible] we noticed a [illegible] coming [illegible] the water [illegible] 10 yards [illegible] We decided to try beaching the raft there [illegible] the [illegible] to [illegible] a foothold.

Tom grabbed a forward line [illegible] a [illegible] pole [illegible] and [illegible] told Tom to [illegible] her [illegible] shore. As we swung in over the roadway, we [illegible] Tommy to cut the [illegible] and Tom [illegible] I [illegible] of [illegible] the levee, slithering [illegible] in the waves as we [illegible] a foothold [illegible] we could [illegible].

Safely ashore Tom took the line [illegible] secured it around a rock, while I [illegible] a pole into the fender timber along the side of

“Towboat” Is a Misnomer; the *Jack Rathbone* Pushes Her Train of Oil Barges

As in Mark Twain's day, the Mississippi [illegible] pilot [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

the tail [illegible] rudder to hold her over the [illegible] end of the tows. With Tom [illegible] her off [illegible], the crew [illegible] for the moment.

Tommy [illegible] back [illegible] of the [illegible] of something the propeller had [illegible] the [illegible] and [illegible] the drive shaft [illegible]. Two were [illegible].

The wind had [illegible] a bit, and we were holding our own until the [illegible] a few feet [illegible] at the [illegible]. I [illegible] and signaled to the [illegible] to move forward. This would [illegible] the [illegible] and [illegible] the [illegible].

Bass and Tommy started to [illegible] engaged in what appeared to [illegible]. Instead of going forward they both jumped into the [illegible] and fought their way to us through the churning water, splashing and stumbling, looking like a couple of [illegible] in their [illegible] jackets.

Dick grabbed the pike pole [illegible] Tommy with his [illegible] and [illegible] of us were able to [illegible] off so that she was no longer [illegible].

Here we stayed for a half hour until the storm spent its fury and the river began to quiet down.

No Damage Done

[illegible] the [illegible] and went [illegible] while Tom and I inspected the [illegible] for damage. There were a few [illegible]. We had come off [illegible].

Just how lucky we were [illegible] know until next morning. While [illegible] up [illegible] and gasoline in Cairo, we learned that [illegible] winds had struck the afternoon before. The

Ten Days from Home, Tourists Dozen While Deck Steers — The Novelty Is Wearing Off

[illegible]

[illegible] and we [illegible] and take our [illegible] to St. Louis.

We preened ourselves at this news.

"And people said the Western could not weather a storm!" Tourists exclaimed. "They didn't know we were old rail builders."

The day had been a full one, what with going around and then hanging the storm. Under way again [illegible] and we were [illegible] in.

Next morning we left Cairo at 7 o'clock and [illegible] on the way down the river. That day we touched four different States: Illinois, Kentucky, Missouri and Tennessee.

"Same way to study geography," Tourists commented.

"Same way to go south," [illegible] tourists, [illegible] tenders!

The River Yields No Wrecks

While we were passing the [illegible] and talked [illegible] of finding old wrecked steamboats on which they could conduct salvage operations. But they [illegible] to the narrow [illegible] that were disappearing in a hurry. We had not sighted a single one.

Souvenir hunting [illegible] into a sharp [illegible] for interesting items of the [illegible] that floated along with us. There was an abundance of that.

But the [illegible] contented [illegible] pretty [illegible] and trees with an occasional chicken coop or barn door, and at [illegible] intervals the [illegible] [illegible].

Rivermen Warn of Stern-wheeler *Sprague*

In several ports we were inspected by the rivermen [illegible] and took over her [illegible]. We enjoyed inspecting the Diesel tugs, [illegible] and river ferries (opposite page), and returned the courtesy by inviting the pilots and engineers to come aboard the *Western*.

They treated us with [illegible] experiences and warnings [illegible]. They [illegible] away from the paddle wheel [illegible], all [illegible] [illegible] left the *Sprague* [illegible] the river and [illegible] problems that we might easily expect to [illegible].

"What is she like?" the boys asked.

"Big [illegible] biggest stern-wheeler ever built!" She [illegible] over 3 feet [illegible] and her wheel is at least 30 feet in [illegible] than 30 feet wide. Sees the highest [illegible] the river and she [illegible] it up when she goes through. [illegible] from the *Sprague*.

We had [illegible] that for equal [illegible] power the middle wheel [illegible] bigger [illegible] [illegible]

Off Helena, Arkansas, Captain Hill Welcomes the Boys Aboard the *Harry A. C. Jaynes*

[illegible] were lost as [illegible] about *Maurice* as the crew [illegible] their [illegible] and [illegible] bits were exchanged [illegible] Hill [illegible] photo [illegible] is contributed by [illegible]

and that stern-wheelers are small. Worse than side-wheelers.

We had met both types and learned how to take their wash without getting unnecessarily tossed about. We weren't particularly worried about them, but we did decide to watch out for the *Sprague* and give her a wide berth.

The pilots [illegible] us about the sudden violent storms that blow up in a matter of minutes. After our experiences at Cairo, vivid in our memories, we knew these warnings of hazards weren't idle talk. But we were all convinced that most of them underestimated the sturdiness of the *Maurice*.

"Look Out for the Eddies!"

[illegible] particularly [illegible] most often mentioned.

[illegible] the eddies at Yellow Bend, Arkansas. [illegible] 30-foot powerboat was lost there.

[illegible] warnings about the river [illegible] to stay out of the eddies where the [illegible] channel below Island No. 57. [illegible] trees [illegible] up 10 feet out of the water and spinning around like a top.

[illegible] stuck, you'd cut in close to the [illegible] at Mile 833 [illegible] Island of Passage where the short cut [illegible] from behind the towhead and against the bank. [illegible] always [illegible] bit it [illegible] a [illegible] has gone [illegible] it'll [illegible] and [illegible] right off your bottom like they were only [illegible]

"Yeah," [illegible] answer to my gloomy forecast.

"[illegible]," Tommie added.

The boys had bolted up the steel strips which held the oil [illegible] in place and took the remark as a reflection on their work.

"[illegible] Lord's disease. I really [illegible] over the [illegible]."

"[illegible]," said Dick [illegible] our official [illegible] and [illegible] to [illegible] mechanic.

Before noon on July 11, as we neared Mart Island, Tom was steering, Tommie and I [illegible] lunch, and [illegible] navigating.

[illegible] the smoke of a steamer ahead [illegible] Lincoln [illegible] would help to the [illegible] progress [illegible] the towhead. The water appeared to be [illegible] but vividly [illegible] of some [illegible] Tom [illegible] to [illegible] course.

Presently the water became [illegible] allow for safety, and he [illegible] and resumed the main channel. The big towboat, pushing

A Wooded Eroded Loess Bluff, Festooned in Moss, Overlooks the River above Natchez

[illegible]

Pilot Manaura's Stern Wheel Spanks the Mississippi — **An Engineer Checks Her Bearings**

eight hours. [illegible]

[illegible] wheel.

[illegible]

[illegible] Mississippi [illegible] Mile 883.

[illegible] Mile 883.

Three Vagabond Raftsmen Perch on a Navigation Marker

[illegible]

"Ye gray. Dad, here's a nob [illegible] for handwrating—Look out for the eddies at Mile 8x?."

Anxiously I went forward with Tom, scanning [illegible] the water ahead.

[illegible] the banks [illegible] The [illegible] enough [illegible] we [illegible] Look at that [illegible] I pointed to the churning current. "This [illegible] water [illegible] is [illegible]

[illegible] the river. Nothing [illegible] "It's just [illegible] the [illegible] and the water.

Indeed, it [illegible] I turned to get on with lunch. Suddenly Tom let out a frantic yell.

"[illegible] Hang on [illegible]"

As I turned to look [illegible] the cause of his warning, the raft gave [illegible] lurch and the [illegible] I could see [illegible] of water [illegible] chest-high as Tom [illegible] the stern [illegible]

As it struck, I was thrown to my knees, [illegible] water, [illegible] and [illegible] of [illegible] and [illegible] around me.

We pitched like a [illegible] as the water [illegible] wave broke over the deck and we reared and came down on each crest as if we were hitting bottom. Water can be [illegible] when [illegible] dead [illegible]

[illegible] for [illegible] and [illegible] damage had been done [illegible] and [illegible] and [illegible] in [illegible]

[illegible] during lunch [illegible] at a [illegible] with [illegible] Bottles [illegible] and [illegible]

Hennepin Clears the Halfway Mark

The potatoes which had been [illegible] in the [illegible] through safely. [illegible] we [illegible] over the fire and scorched them [illegible] a can of [illegible] and dessert of [illegible] Weather, [illegible] light lunch.

At 3:45 on July 12 we [illegible]

[illegible] light of Mile [illegible] [illegible] trails [illegible]. The crew heard about [illegible] [illegible] the thought that [illegible] was lost.

As the days and the miles dropped behind us, time [illegible] [illegible] at Memphis, Helena, and Greenville.*

We spent an afternoon [illegible] at Vicksburg and visited the U. S. Waterways Experiment Station of the U. S. Army Engineers there.† Here we saw the models of the Mississippi [illegible] flood control.‡

At Baton Rouge we received mail from home and went up to the Louisiana State Capitol.

Near Mile [illegible] we [illegible] for the night [illegible] Bend near the [illegible] named Avery Thompson. At Evans [illegible] Landing, Mile 178 [illegible] we stopped near [illegible] Arnt's extensive [illegible] establishment. [illegible] had heard [illegible] the [illegible] read about us in the Donaldsonville [illegible] weekly [illegible] came out [illegible] a visit [illegible] stay with them for a few days.

[illegible]

It's Dick's Turn to Cook; He Plucks a Fowl

[illegible] aboard [illegible] [illegible]

Gifts of Chicken "Fresh off the Hoof"

Though [illegible] [illegible] of catfish and chickens "fresh off the hoof" [illegible].

Mr. Thompson showed us [illegible]. This is the American paddlefish (Polyodon spathula), not a catfish at all. The long end of this odd-looking creature [illegible] as long as the [illegible]. [illegible] Nature's mysteries.

The paddlefish [illegible] of the Australian platypus, Mr. Thompson [illegible].

"It's the strangest-looking thing I've ever seen in my life," I said.

---

* See, in the National Geographic Magazine, [illegible] [illegible] September 19[illegible].

† See, in the National Geographic Magazine, [illegible] "[illegible] Mississippi [illegible]," September [illegible], and "[illegible] the River," June [illegible].

‡ [illegible]

Brandon Road Lock at Joliet, Illinois, Lifts Gulf-to-Chicago Barges at Dam

[illegible] separate Mississippi and St. Lawrence [illegible] The [illegible] Lake Michigan water into the Mississippi, until [illegible] the [illegible] Panama [illegible] to the [illegible]

Water in the Forebay Basin Backs Up above Town Before Cascading over the Spillway

[illegible] through the 600-foot lock

The duckbill cat, limp in my hands, seemed to cast a reproachful eye at me. Just then Mr. Thomason's gaze wandered to the *Meanco*. Both Mr. Platypus and Mr. Thomason very likely were thinking the same thing about the *Meanco*, but if so, each was too polite to mention it.

We cased upstream a few miles into some of the tributary streams: the St. Francis, the White (which Dick and I had fished in the Ozarks), the Arkansas, and the Atchafalaya, that river with the unpronounceable name, which doesn't know whether to flow downstream or upstream, toward the Mississippi or away from it.

On the afternoon of July 21 we went into the upper end of Deer Park Bend at Mile 342 for our night mooring. This bayou used to be a huge bend or loop in the main channel. In 1933 a cutoff was dredged across the neck of the bend, shortening the sailing channel about 3 miles. This artificial short cut, Glasscock Cutoff, is about four miles long and rather narrow.

Next morning we re-entered the main river about 9 o'clock and started down the cutoff. It was raining lightly and the visibility was about a mile. A half-mile into the cutoff we observed a big tow and barges approaching from downstream.

"She's a big one," said Tom.

"A stern-wheeler," I added.

"Pushing a big tow," Jack contributed.

"And she's coming pretty fast," Tommy finished.

Tom and I hastily consulted the chart and observed that the sailing line was shown to be toward the east bank. Presumably a big craft like this one would follow the official channel; we elected to pass her on our starboard side, as was proper. We proposed to split the difference and pass midway between the approaching vessel and our right bank.

The *Sprague*, at Last

As we approached, we saw that her wheel was as high as her third deck and was throwing a terrific cascade of water. We made the boys don their life preservers and placed oars near at hand.

Tom was at the wheel, and I stationed myself at the motor, to cuss it along if it chose to malinger.

As we met the modest bow wave thrown out from the front barges of the long tow, we saw the name of the big stern-wheeler. It was the *Sprague*.

"One thousand miles in which to meet her, and here we are, dead upon her in a narrow channel," I groaned.

Then her stern wave hit us. The *Meanco* pitched and rolled, with water pouring over her deck and the motor alternately groaning and screaming as the propeller was lifted clear of the water.

Tom at the wheel hopefully searched for quieter patches of water as we bucked waves six or seven feet high and water swept over our deck. Loose gear surged at the lines with which we now kept it secured. The boys, even on their perches atop the lockers, were drenched, but enjoying themselves hugely.

River Goes Hog-wild

Tom took the *Meanco* back and forth across the river, pointing the bow into the waves and dodging the mountainous waves. But they didn't continue as orthodox waves; when the back action of the waves crashing the banks met the original sequence of crests, they weren't waves any more. The whole surface of the river went hog-wild, surging and churning as if possessed.

I clutched the rail with one hand and the throttle with the other, following Tom's signals to "open her wide" or to "hold her down." We both were so busy that we hardly got a look at the *Sprague*.

The river was rough for nearly an hour after the passing, and by the time it was calm I and I had our vitals swallowed down where they belonged. Now we knew what the rivermen had been talking about when they warned us of the *Sprague*.

That afternoon I examined the charts and found that the cutoff where we met her, a quarter of a mile wide, is one of the narrowest places on the river between Cairo and the Gulf.

Later I checked on the size of the *Sprague*. Owned for more than 20 years by Standard Oil of New Jersey, she was built in Dubuque, Iowa, in 1932. Her paddle wheel is 37 feet in diameter and 40 feet wide, and her engines are 2,600 horsepower. She is the largest and most powerful stern-wheeler ever built for any inland waters (pages 559, 567).

By all who know her and her prodigious feats, she is affectionately called "Big Mamma." On an upstream trip she may shove as many as 10 big barges, the whole assembly actually exceeding the liner *Queen Mary* in length.

The *Sprague* does well to labor heartbreakingly at her tasks, because she is on her way out. Already many of her picturesque sister craft have gone to whatever port old steamboats go to, the junkyard most likely.

She is a symbol of passing splendor, for the Diesel men claim that a 2,000-horse-

[illegible] all the [illegible]

We [illegible] Diesel [illegible] while they are solid and impressive, they lack the grandeur and ornamen[illegible] of the old [illegible], of which [illegible]

After the experience with the [illegible] I [illegible] ocean-going [illegible] below Baton Rouge. Their waves [illegible] be higher [illegible] would be farther apart and [illegible] would be more room [illegible] to avoid them.

Subsequently we [illegible] meet an ocean-going tanker below Baton Rouge. We figured her to be about 10,[illegible] tons, though she was too far away for us to identify her.

[illegible] waves [illegible] the [illegible] waves [illegible] insure our craft against bridging them. We coasted [illegible] down one wave, across the trough, then [illegible] up the hill of the next.

[illegible]

A Mississippi Relic Crumbles on the St. Louis Water Front

[illegible]

Tom, ensconced in the deck chair, feet on the rail, smiled a broad smile of approval of this elegant sensation.

"Here's the type of water this baby was made for," said he.

Last Night Aboard

Twenty-seven miles from New Orleans we [illegible] our last night aboard. [illegible] a modern ocean tanker [illegible] of the [illegible] Oil Company [illegible]. After we [illegible] our [illegible] her over, and [illegible] her [illegible] aboard. [illegible] the ship, the *Vike*, out of Goteborg, Sweden, a 12,500-[illegible] ship built in 1930. After our tour of inspection, her second officer and [illegible] accompanied us down the [illegible] and [illegible] the *Manana*, where they signed our map chart.

[illegible] we passed under the [illegible] Huey P. Long Bridge and into the New Orleans harbor.* Our destination was the Allen Boat [illegible] on Sunday the *Manana* was to be [illegible] for sale to the highest bidder.

---

* [illegible]

A Levee That Held — Barges Breaks under the Punch of a Tropical Hurricane

With [illegible] Army Corps of Engineers [illegible] break in [illegible] New Orleans [illegible]

About a mile from our destination [illegible] suddenly did.

"Rex, I'll bet we're making some [illegible] miles on one shear pin." A shear pin acts as a mechanical fuse, giving way if the propeller strikes a snag, thus tending to [illegible] the propeller's breakage.

I agreed [illegible] only would be a remote [illegible]

We [illegible] near the Alton Boat Co[illegible] as [illegible] down the canal and stood up [illegible] and [illegible] our arrival.

"The Fleet's In!"

Each of us [illegible] his best nautical air as Tom brought *Mecca* smartly around to berth her in the [illegible].

About 200 [illegible] from [illegible] we were trying to make [illegible] seamanlike finish to our journey, the engine suddenly went free and [illegible]. Our speed slackened dismally [illegible] jumped to kill the screaming motor.

Another mighty cheer, this time of the [illegible] variety, went up from the men on the [illegible].

At the moment of our triumphal entry, the shear pin had given way.

Chagrined at this anticlimax, Tom and I [illegible] a new pin, and [illegible] 0 p.m. the *Mecca* pulled into the dock. Journey's end at last.

"The fleet's in!" we wired our family.

Behind us lay 1,400 miles, nearly a month, [illegible] travel on the storied river. We [illegible] healthy and brown as Indians; none of [illegible] had a minute's illness.

We [illegible] treasury of memories of starry nights in the bayou [illegible] and [illegible] the innumerable [illegible], of fun and excitement and companionship.

Most of all, Tom Roth and I treasure the [illegible]ship with our sons. We [illegible] that the boys will never think [illegible] of the *Mecca* without warm memories of their dads.

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ORGANIZED FOR THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE

To carry out the purpose for which it was founded [illegible] the National Geographic Society [illegible] is supported [illegible]. All proceeds are invested [illegible] expended directly to promote geographic knowledge.

Articles and photographs are invited. For [illegible] the Society uses great discrimination in [illegible].

In addition to the editorial and photographic surveys regularly being made, The Society [illegible] this year [illegible] scientific expeditions [illegible] years of field work to [illegible] their [illegible].

The Society's possible expeditions have ranged back [illegible] to the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By digging the ruins of the east communal dwellings in Chaco Canyon, [illegible] scientists [illegible] the prehistoric [illegible] in the United States.

In Mexico, The Society and the Smithsonian Institution [illegible] discovered the oldest [illegible] in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November [illegible] 6 B.C. Astronomy [illegible] 400 years ago, [illegible] in America, and [illegible] early American culture, perhaps [illegible].

[illegible] the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, [illegible] to the [illegible] of 13 [illegible] Capt. Albert W. Stevens and Capt. [illegible] A. Anderson took all the [illegible] and obtained results of extraordinary value.

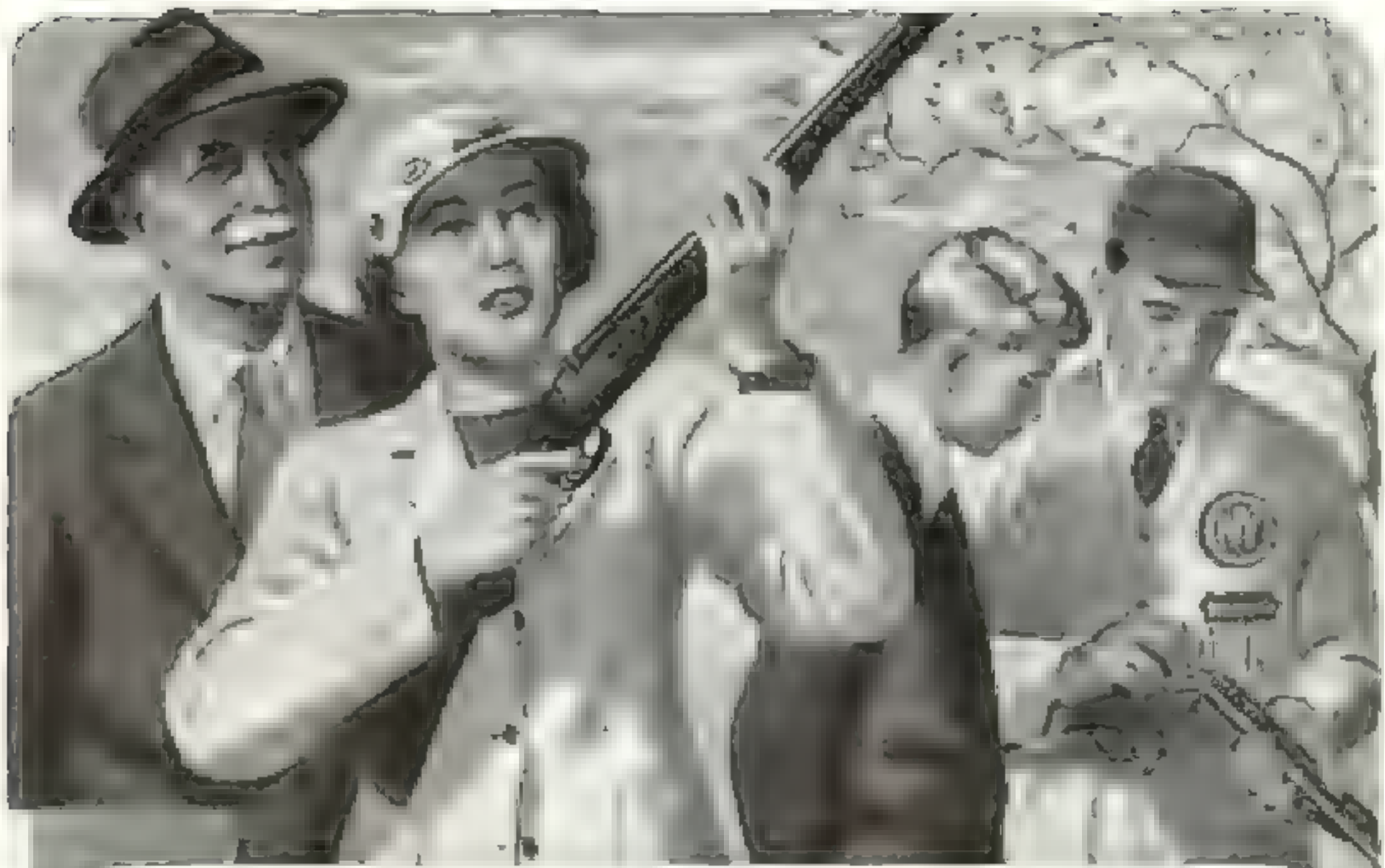
The National Geographic Society-U. S. Army Air Corps Expedition, from a camp in southern Brazil, [illegible] and observed the great eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda. Dr. Beebe's record depth of [illegible] feet was established.

The Society granted $[illegible] and in addition $[illegible] was given by individual members to the Government when it [illegible] an additional appropriation for the purpose was needed, and [illegible] of the giant sequoia trees in the Grant Forest of Sequoia National Park in California were thereby saved for the American people.

One of the world's largest [illegible] of glacial ice [illegible] was discovered in Alaska and [illegible] by Bradford Washburn, who is exploring for The Society and the Harvard [illegible].

Published by the National Geographic Society, Washington, D. C. [illegible]
Printed by [illegible] Entered as the Post Office at Washington, D. C. [illegible]



Who's the "champ" in your family?

GRANDFATHER [illegible]

MOTHER? [illegible]

SON? [illegible]

DAD? [illegible]

[illegible]

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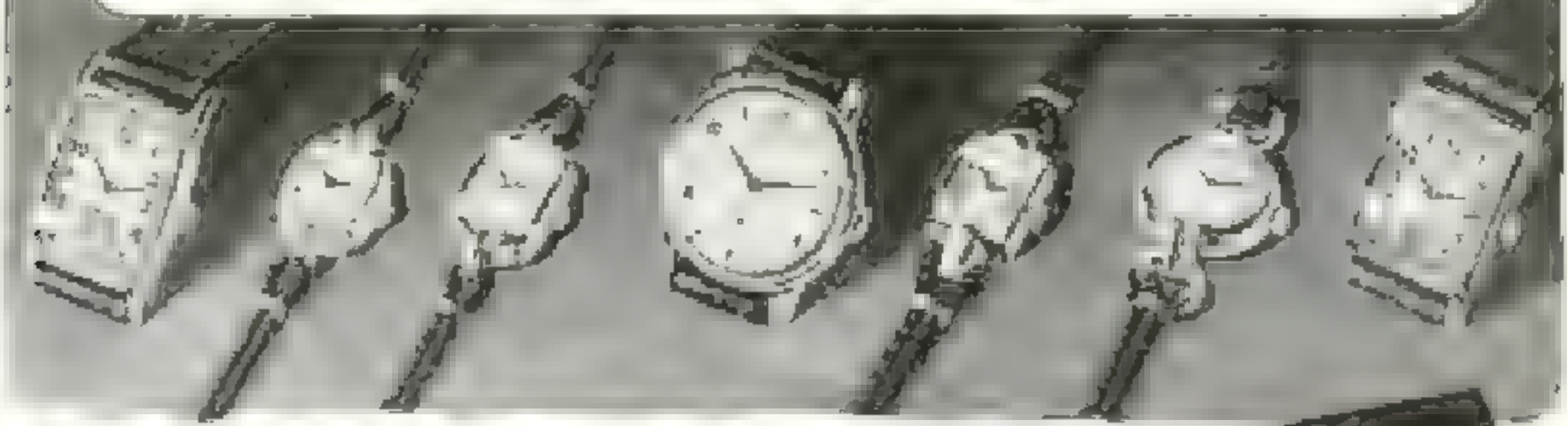

LEFT TO RIGHT [illegible]

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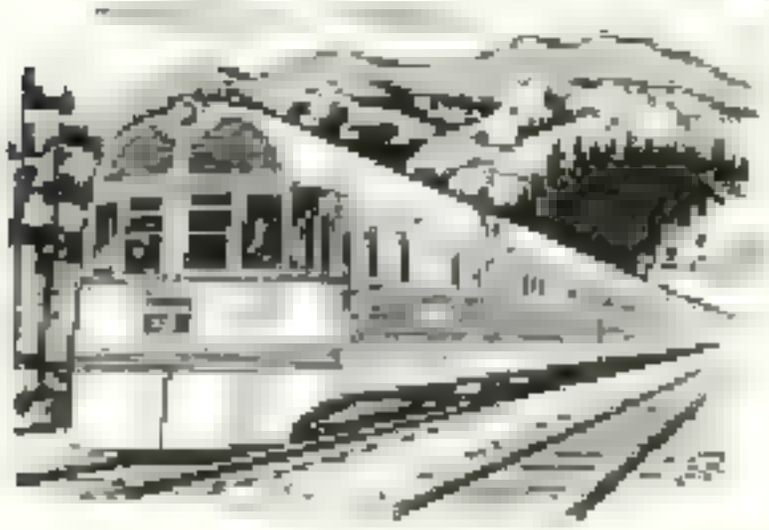

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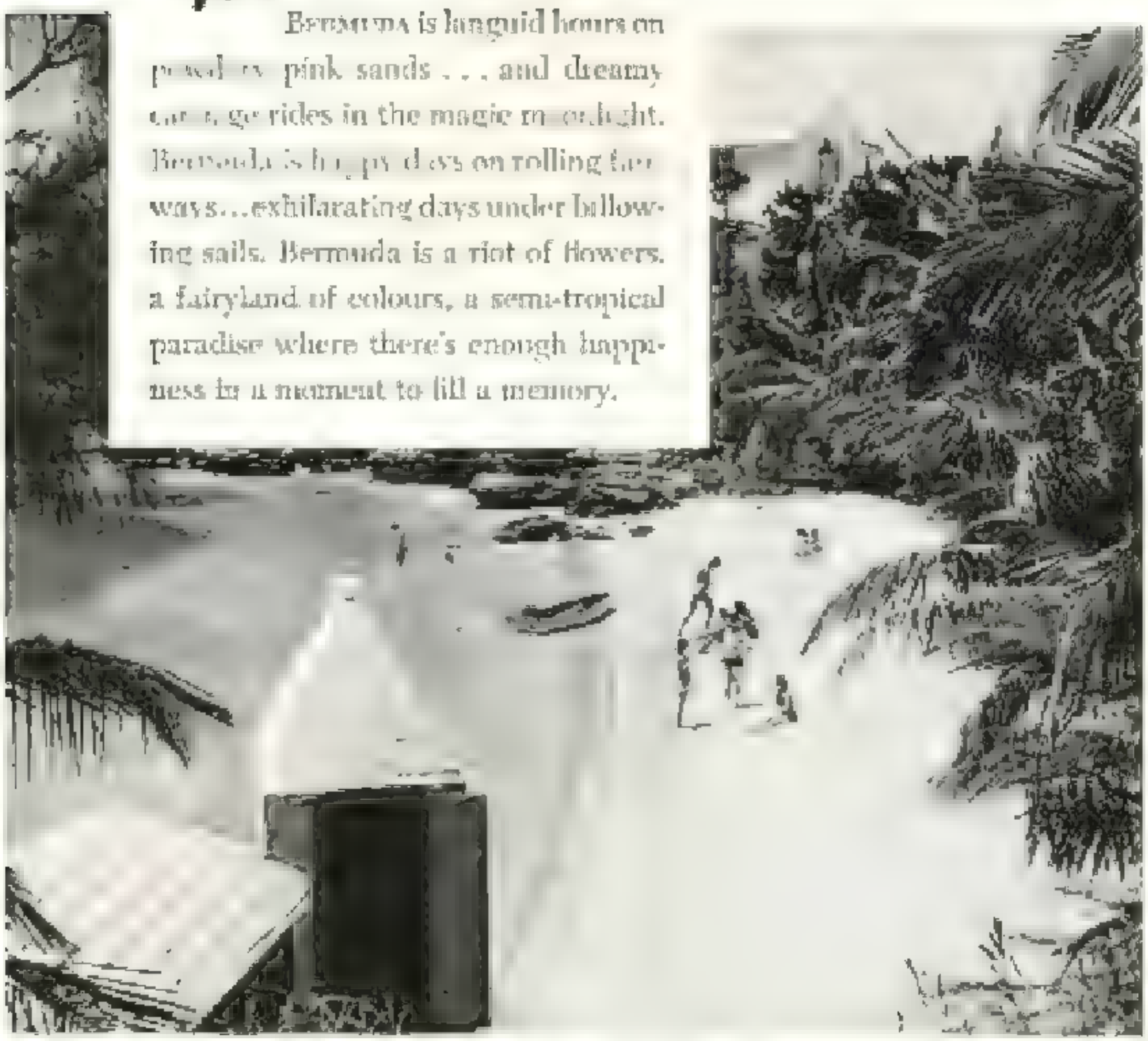


BERMUDA is languid hours on peaceful pink sands . . . and dreamy carriage rides in the magic moonlight. Bermuda is happy days on rolling fairways . . . exhilarating days under billowing sails. Bermuda is a riot of flowers, a fairyland of colours, a semi-tropical paradise where there's enough happiness in a moment to fill a memory.

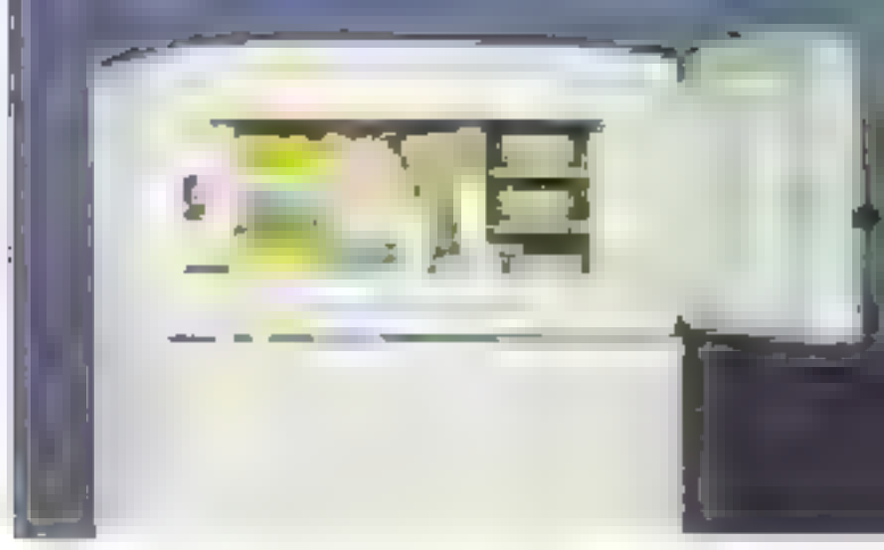
YOU CAN COME to Bermuda [illegible] place . . . or luxuriously [illegible] [illegible] Travel Agent will [illegible] complete [illegible] — it's [illegible]

EVERYTHING IS BETTER IN

Bermuda

FOR NEW ILLUSTRATED BOOKLET — write The Bermuda Trade Development Board, Hamilton, Bermuda, or 620 Fifth Avenue, New York 20, N. Y.

Most advanced of today's refrigerators



The upper compartment is a Home Freezer —separately refrigerated and insulated with its own separate door!

ZERO STORAGE: For quick-freezing foods and ice cubes, and for dependable, long-time storage of up to 33 pounds of frozen foods. This compartment will provide zero temperature at *all* times. And zero temperature is very important in keeping frozen foods.

The following "Timetable" shows practical storage periods for maintaining high quality of frozen vegetables, fruits, and meat at different temperatures:

0°...up to 12 months 15°...up to 1 month
10°...up to 3 months 20°...1 to 2 weeks

The lower compartment is a Space Maker refrigerator—separately refrigerated and insulated, with its own separate door. No defrosting!

The 1948 General Electric Refrigerator-Home Freezer Combination

The two-door refrigerator offers important advantages . . . plus famed G-E dependability!

In convenience, efficiency, and economy, this great, new refrigerator offers you more than any "two-temperature," one-door refrigerator.

No waste of food in the freezer when you open the refrigerator door! No condensation and dripping into the refrigerator from the freezer compartment.

And, of course, you get the very important advantage of famed General Electric dependability.

This great refrigerator is equipped with the G-E sealed-in refrigerating system—airtight, oilright, and unmatched for dependable performance.

See the General Electric Refrigerator and Home Freezer Combination at your retailer's. General Electric Company, Bridgeport 2, Conn.

FRESH-FOOD STORAGE: Gives you cubic feet of storage space for fresh foods. (This is practically as much refrigerated *fresh food* storage space as in an ordinary Sixteen-foot refrigerator.) Never needs defrosting. Keeps the temperature and humidity just right at all times. No need to cover dishes *in the refrigerator!*

More than 1,700,000 refrigerators in service ten years or longer

GENERAL ELECTRIC

WHEN THIS DOOR OPENS... *France* HERSELF

BIDS YOU WELCOME!

It is like stepping out of one way of living and into another . . .

the very act of boarding your Air France Comet. France herself stands in the doorway . . . makes you welcome . . . serves you her fine, [illegible] tempting foods . . . [illegible] wines or champagne . . . [illegible] you the spark of adventure, the joy that only a long-planned French vacation holds in store. Instantly you feel you are in France . . . as indeed you are . . . with Paris itself only hours away.

When you go . . . GO

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70 YEARS OF OVERWATER FLYING

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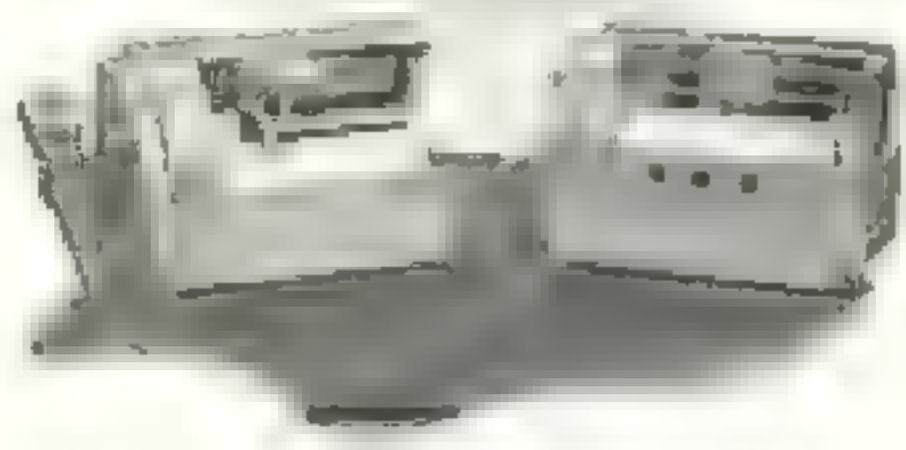
"My secretary and I just adopted the Dictaphone twins!"

My favorite [illegible]

[illegible]

[illegible] speed and [illegible] is built [illegible] on Dictaphone [illegible]

That's for me! It's [illegible] —latest addition [illegible]



The Dictaphone Twins

For an eye-opening, ear-opening demonstration, call your local Dictaphone Representative. Let him show you how the Twins can save you time and money. Or just mail the coupon below.

DICTAPHONE

Electronic Dictation

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Top Performance

demands top condition

It's time to see your Texaco Dealer for a Spring check-up ✓

✓ He will check your spark plugs, battery, tires. Flush radiator. Make complete undercar inspection.

✓ He will lubricate chassis with Long-Lasting MARFAK, the multi-purpose lubricant that gives you easier steering. He'll protect gears with proper Spring grade of Texaco transmission and differential lubricants.

✓ For more miles, power, economy, he'll fill the crankcase with HAVOLINE, the *modern* motor oil, CLEANS as it lubricates.

✓ For power to spare, get Texaco SKY CHIEF gasoline, the luxury fuel for those who want the best — or Texaco FIRE-CHIEF, the motor fuel for utmost power at regular gasoline prices.

THE TEXAS COMPANY

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A million square miles of vacation country —calling you north of the border to play.

Cruise Canada's scenic, historic waterways while you relax to the rhythm of shipboard life. Here's a carefree holiday for your whole family.

Picture-country! Wherever you travel in Canada, there are scenes that are prettiest for your camera.

Authentic native crafts and rest to your shopping and gift-hunting. Stores are well stocked again.

Say "Hello again!" to the friends you've made, the favourite spots you've learned to love on previous trips to Canada. Or see it all for the first time. Either way, you'll find exciting new things to do—mountain trail riding or big-city sightseeing—family fun on friendly beaches or watching wild life in a horizon-bounded National Park. And don't forget—your dollar buys *more* vacation in Canada. Come along this year! For illustrated literature, write

Canadian Government Travel Bureau, Department of Trade and Commerce, Ottawa, Canada

Minister

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Vacations Unlimited

CANADIAN GOVERNMENT TRAVEL BUREAU

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Please send me your illustrated book "Canada, Vacations Unlimited" — Please Print

Name

Street and No.

Town State

Mother was tickled pink that Dad had the last word!

"STOP!" **Dad said,** "Let's not rush into this matter of a new radio!" We couldn't quite make him say yes. Even after a second cup of Mother's coffee! So Mother waited a few days. Then—"unexpectedly"—we all found ourselves in front of a store that sells Stromberg-Carlson!

"LOOK!" **Mother said,** "Have you ever seen such exquisite cabinets! Tom dear, can't you imagine that lovely Hepplewhite in *our* living room!" I could see Dad was beginning to weaken. He's rather proud of his appreciation of fine furniture.

"HEPPLEWHITE"...for the living room. 156 AM radio-phonograph combination in authentic 18th century design. Automatic record changer with automatic stop. Hand rubbed mahogany veneers.

"LISTEN!" **said Dad,** as he tuned in an FM station. "That's so true to life, I feel I could shake hands with the orchestra!" Then we heard some Strauss records and a few standard broadcasts. Next thing we knew, Dad was telling us that what we needed most was a new Stromberg-Carlson! "Tom," said Mother, "I've never been so happy—to let *you* have the last word!"

See the difference—
hear the difference

Visit your Stromberg-Carlson dealer—listed in the classified pages of your 'phone book.

Radio-phonograph combinations from $199.50 to $625.00—Table models from $31.95. (Slightly higher in South and West.) Also, brilliant new television in console and radio-phonograph models.

STOP!—LOOK!—and LISTEN!... THERE IS NOTHING FINER THAN A

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Radios, Radio-Phonographs, FM and Television • Sound Equipment, Intercommunication Systems • Telephones and Switchboards

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BANFF WOULD BE A HONEYMOON HAVEN!

THAT SMART CANADIAN PACIFIC travel agent knew we'd find honeymoon happiness at *Banff* in the heart of the Canadian Rockies! He planned our trip, and I'm sure no one ever took a search con[illegible] or enjoyed such special service but everything at our Canadian Pacific is special

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a paradise surrounded [illegible]:
on all sides by high [illegible] mountain peaks.
You'd be deprived of luxury ... but [illegible] it
A mile-high golf course, [illegible] pools, [illegible] riding

LAKE LOUISE IS SPECIAL, TOO... forty breathtaking miles from Banff. Farther out, Emerald Lake glitters in the mountain sun. The Columbia Icefields are fantastic! And even deep in the stockade, Canadian Pacific pampers you with modern, comfortable hotels and lodges and that special Canadian Pacific service.

SPECIAL! [illegible] word for all Canadian Pacific service, whether [illegible] one of the [illegible] coast-to-coast hotels and lodges [illegible] their [illegible] miles of rail. It's in the world's finest [illegible] travel system. Get to know its all [illegible] for your next trip

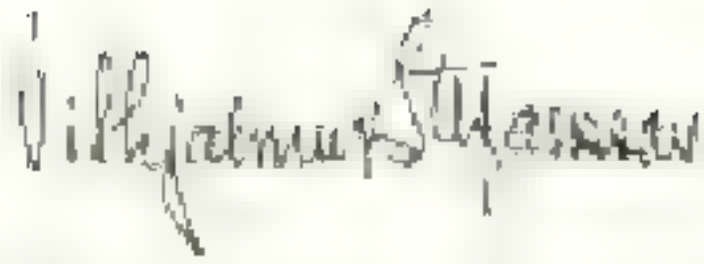
Canadian Pacific

SPANS THE WORLD

Let Canadian Pacific be your [illegible] on all transportation

Railways • Steamships • Air Lines • Hotels • Communications • Express

IN THE HAND OF



Vilhjalmur Stefansson, world-famous scientist and explorer, who has contributed much to our knowledge of the northern polar regions. He is editor of the popular book, "Great Adventures and Explorations."

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Parker "51"

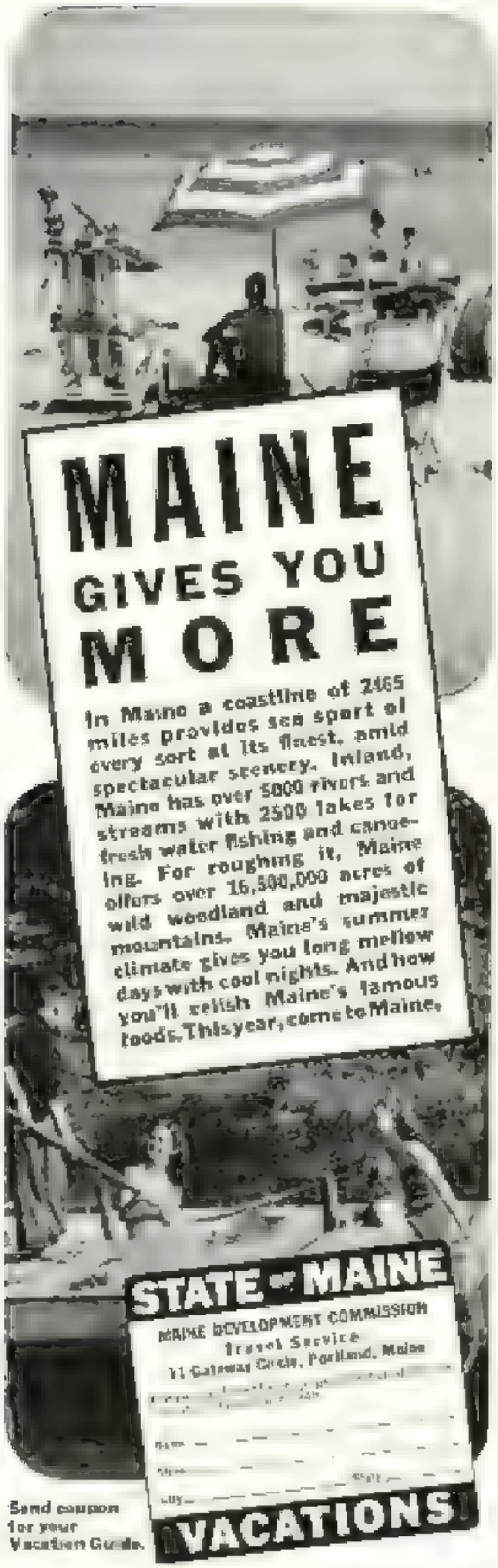
NORTH—south—east—west Parker "51" is the preferred writing instrument.

77 surveys in 29 countries proclaim its popularity. Even in far-off Sydney, Australia, for example, the preference for Parker exceeds that of the *next three leading makes combined!*

Here is a pen of simple, unspoiled beauty. Precision-made from cap to point. You choose from a wide range of individualized custom points. Each starts on the instant—glides across the paper with light and eager touch.

Only the "51" is designed for satisfactory use with new Parker *Superchrome*—the super-brilliant, super-permanent ink that *dries as it writes!*

See the "51" today. An ideal gift for birthdays and anniversaries. Choice of distinctive colors. Individual "51" Pens (including the new *demi-size*), $12.50; $15.00. Pencils, $5.00; $7.50. Sets, $17.50 to $80.00. The Parker Pen Company, Janesville, Wis., U.S.A., and Toronto, Can.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GIVES YOU
MORE
In Maine a coastline of 2465 miles provides sea sport of every sort at its finest, amid spectacular scenery. Inland, Maine has over 5000 rivers and streams with 2500 lakes for fresh water fishing and canoeing. For roughing it, Maine offers over 16,500,000 acres of wild woodland and majestic mountains. Maine's summer climate gives you long mellow days with cool nights. And how you'll relish Maine's famous foods. This year, come to Maine.
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THE ECLIPSE LAWN MOWER CO.
HAND AND POWER MODELS

Round up of summer fun . . .

Yellowstone Park, Montana Rockies and the Olympian Hiawatha

It shouldn't be news that beautiful and mysterious Yellowstone is an all-American vacation attraction. Nor that dude ranchers and fishermen can find their earthly paradise in the nearby Montana Rockies.

But maybe it is news that you can go at low cost on The Milwaukee Road's Olympian HIAWATHA. Only one night en route from Chicago. There are standard Pullmans with rooms and berths, unique Tourist sleepers combining new comfort with economy, also reclining chair coaches. All passengers are welcome in the diner and in the Tip Top Grill with its snack section and cocktail lounge.

★ *Plan from Free Vacation Literature*

For picture-crammed folders giving information on Yellowstone and Montana vacations, write to H. Stephenson, Passenger Traffic Manager, The Milwaukee Road, 800 Union Station, Chicago 6, Ill.

Topped off with de luxe equipment on the Olympian Hiawatha is the exciting Tip Top Grill car with its smart cocktail lounge and restaurant section.

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Chicago, Milwaukee, St. Paul & Pacific Railroad

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Ask for them at your bank. In denominations of $10, $20, $50 and $100. Cost 75¢ for each $100.

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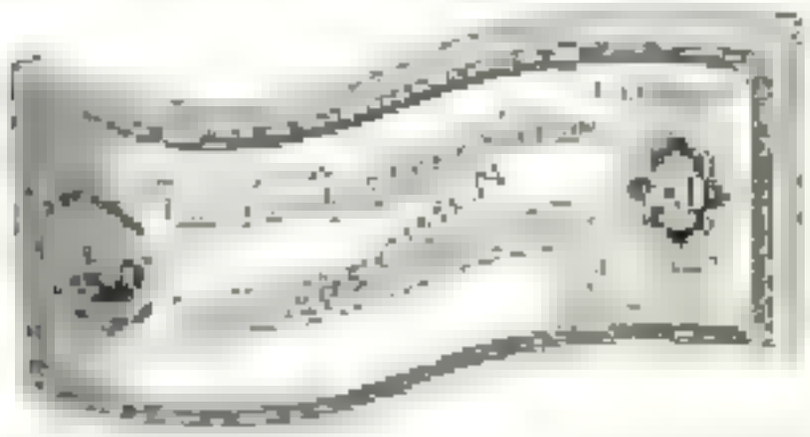
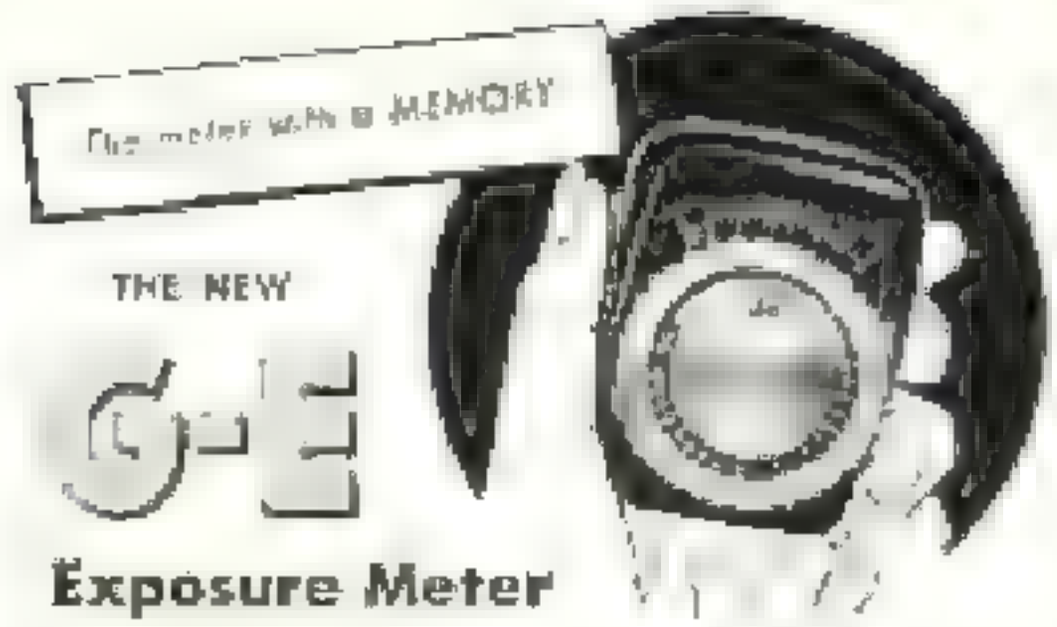


BACKED BY AMERICA'S GREATEST WORLD-WIDE BANK



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Type PE-1

Only G-E gives you all these advantages . . .

• Easy to use—gives correct camera settings in 5 seconds for better movies, stills, color • Extra help for tricky scenes • Pocket size • Automatic shift for bright light or dim • Sturdy, lightweight, real pocket size • At photo dealers everywhere. General Electric Company, Schenectady 5, N. Y. **$32.50***

Actual retail price. Low-light meter [illegible] $19.95

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A [illegible] country on your doorstep! Today in fish-ing, hunting, sightseeing, resorts and shopping centres. Easy to get to, easy on the pocketbook and yet a different country a long way [illegible]

ONLY DUAL-TEMP GIVES YOU ALL 4 FEATURES!

No defrosting

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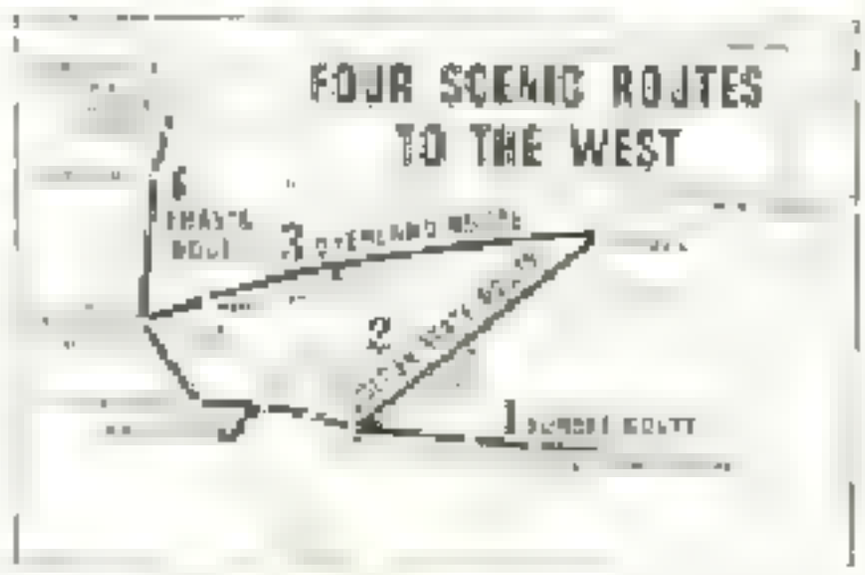
Refrigerators

Performance proved in over 200,000 kitchens!

On your S.P. Trip To California

See twice as much for the same rail fare



S·P The friendly Southern Pacific

A wonderful *new* Greenbrier will open April 19th

ON APRIL 19TH, The Greenbrier will again open its welcoming doors
You'll recognize the familiar façade, but not the interior,
for The Greenbrier has been *completely* restyled and redecorated
Its hospitable personality persists but each of its guest rooms,
suites, cottages and public rooms has been given
individual creative treatment by the noted Dorothy Draper
Visit The Greenbrier, enjoy its unparalleled social and sports facilities.
You will appreciate that no effort has been spared to make The Greenbrier
the most luxurious, the most enjoyable resort hotel in the world

THE Greenbrier AND COTTAGES

WHITE SULPHUR SPRINGS, WEST VIRGINIA

NEW YORK [illegible] - CHICAGO [illegible] WASHINGTON ST. [illegible] - WASH[illegible] 5, INVESTMENT BLDG. [illegible]

New Revolution in Hearing Aids

[illegible]

[illegible]

[illegible]

Revolutionary Money-Back Trial

[illegible]

Wear it at home, at work, at movies, anywhere. COMPARE ITS QUALITY, PERFORMANCE, OPERATING ECONOMY [illegible] than 10 year battery cost with that of ANY other hearing aid. If the Zenith "75" does not excel on ALL counts . . . if it isn't better than you ever dreamed ANY hearing aid could be [illegible] return it within ten days of receipt and get your $75 back in full!

And [illegible] you over $200. If [illegible] would have to [illegible] $150, [illegible] $75 [illegible] Zenith [illegible] Your [illegible]

Look [illegible] your dealer for [illegible] and hearing

BY THE MAKERS OF THE WORLD-FAMOUS ZENITH RADIOS

MAIL THIS COUPON TODAY

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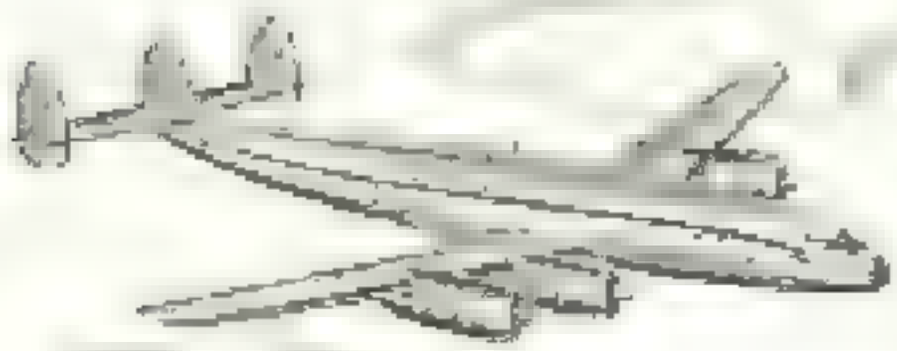

FLY THE Shamrock Route

SUCH SERVICE! Such food! Such comfort! . . . when you take the famous Shamrock Route to Ireland and the capitals of Europe.

And the planes! Great, new Constellations, the latest models of the powerful, veteran transatlantic airliner.

"Shamrock" flights leave at convenient hours on Mondays, Wednesdays and Fridays from New York—and on Mondays and Wednesdays from Boston.

For reservations and information, see your travel agent, or Irish Air Lines office: . . . in New York, 33 East 50th Street, PLdomda 5-4002—in Boston, Hotel Statler, HAncock 6-6630.

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LAWN MAINTENANCE
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You of all People
in a
TEPEE
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WESTERN STARS

Come "home" to Colorado's unspoiled wilderness—everything furnished. We do all the work. Bring your equipment, tepee, sleeping bag, mattresses, hot water bottles, tropic roll, bed boards, new power lawn mower, tropic helmet, with flowers, new power lawn mower, camp cookery, fresh vegetables, milk, or just rest. Comfort of Cozy Continental Divide. Tepee, ski lift, heated swimming pool. All new. Come great lower. No extra charges; no tips. Complete 6-23 p. Rocky Mtns. [illegible]

Reserve now [illegible] September 24. Stay week or for, Colo Springs for $14.67 or 10 days all inclusive. [illegible] $7.80 a day.] Registered nurse.

Star to Centers, [illegible] Arts Wing Hotel, Colo Springs, Colo.

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300 watt Brilliant Illumination plus many added features

Your 35mm Kodachrome slides spring to life with amazing realism. All colors are more brilliant, more sharply defined. Black parts are deeper and more contrasty too. The reason is the special Ampro condenser system that concentrates maximum illumination from 300 watt lamp. Other Ampro features include: Self Centering Slide Carrier—it puts frame each slide accurately and maintains hair-line focus—Coated lens—Condenser lens easily removable for cleaning—handsome Lift-Lid Case. Ask for demonstration at better photographic and department stores in your locality!

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On Ampreslide Projector Model 30-A with data on and prices. If you are interested in sound motion pictures, send 10 cents for 16-page booklet "The Amazing Story of Sound Motion Pictures." Dramatically illustrates how sound films are made.

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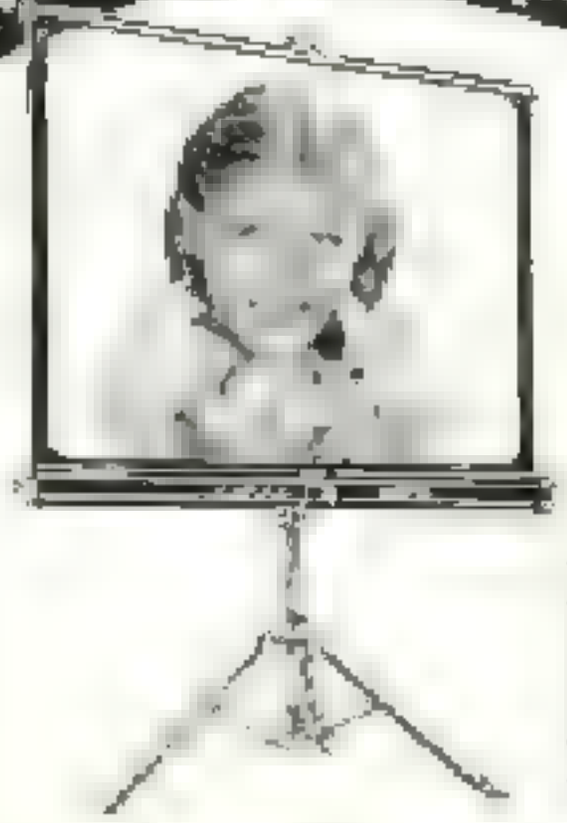
YOUR STARS Really SHINE



ON A

DA-LITE

SCREEN

DA-LITE CHALLENGER

The one [illegible] medium-priced [illegible] lower [illegible] [illegible] [illegible]

Every inch the Chief

Yes, *Little Chief*, our Chief measures up to the name!
For it is the all-Pullman, extra fare, transcontinental streamliner (along with the daily Super Chief) that is famous among discriminating travelers for smooth-riding speed, roomy comfort, and delicious Fred Harvey meals.

The Chief provides daily service between Chicago and Los Angeles, Chicago and Denver, Chicago and San Diego.

In connection with the New York Central 20th Century Limited, the Pennsylvania Broadway Limited, and Baltimore & Ohio Capitol Limited, it provides daily Pullman service between New York and Los Angeles, and between Washington and Los Angeles without changing cars.

SANTA FE SYSTEM LINES . . Serving the West and Southwest

J. E. Collins, General Passenger Traffic Manager, Chicago 4

3 lines of defense against CANCER

YOU are the first line of defense!

Alertness is your job. It's up to you to note cancer's warnings early, while chances of cure are best. That's why you, and everyone, should learn cancer's "danger signals" (they are listed below), and tell your doctor at once if any of these warnings appear. Sometimes cancer gives no warning, so it's also wise to have a thorough medical examination at least once a year.

The second line of defense is diagnosis!

This is your doctor's job. The "danger signals" are NOT sure signs of cancer, so it's up to your doctor to find out their cause. In many cases the doctor may advise further examination at a cancer clinic or hospital, or by a specialist. If he does, don't be alarmed. The chances are you don't have cancer. For example, out of 654 women who visited one clinic because most of them had suspicious symptoms, 646 or 98.8 per cent were found to be completely free of cancer!

The third line of defense is treatment!

There are still no drugs, no pills, no "sure cures" for cancer. The only treatments that have been successful are surgery, which removes the cancer, and radiation, which destroys it. Success often depends upon starting treatment early. Medical experience shows that the chances of effecting a cure are much greater when proper treatment begins in the early stages of the disease.

These are cancer's "danger signals"

1. Any unexplained lump or thickening, especially in the breast. 2. Any irregular or unexplained bleeding. 3. A sore that does not heal, particularly about the mouth, tongue, or lips. 4. Noticeable changes in the color or size of a mole or wart. 5. Loss of appetite or continued unexplained indigestion. 6. Any persistent change in normal elimination. 7. Any persistent hoarseness or unexplained cough. **Pain is not an early symptom of cancer.**

To learn more about protecting yourself from cancer, write for Metropolitan's free booklet, 48-N "There's Something YOU Can Do About Cancer."

Metropolitan Life Insurance Company

(A MUTUAL COMPANY)

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Now finer than ever... with the

Lifetime Musaphonic Diamond Reproducer

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RADIO-PHONOGRAPHS

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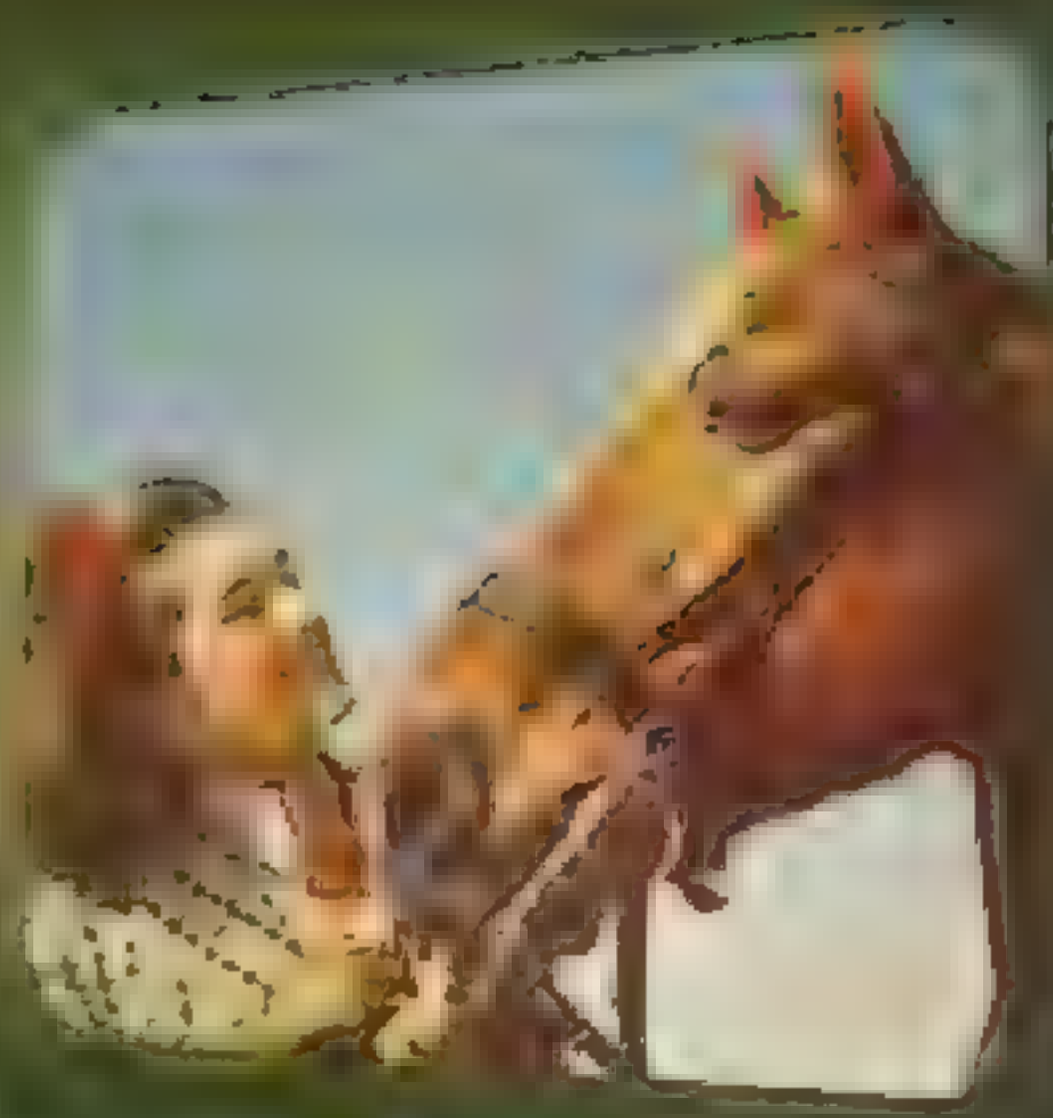
wherever you may be–

when you think of refreshment,
think of Coca-Cola

For Coca-Cola makes any pause
the pause that refreshes
and ice-cold Coca-Cola is everywhere

Double Reward

from Kodachrome Film in your miniature camera



Projection: your projected Kodachrome transparencies are the "show window" of color photography.

Prints: your Kodachrome Prints are fine examples of full-color printing.

YOU'RE [illegible] closer partnership with the world around you when you [illegible] with miniature cameras [illegible] Kodachrome Film . . .

Creatures [illegible] . Turn your exposed [illegible] Kodak developing [illegible] transparencies [illegible] without ever change. Prepare [illegible] series—big [illegible] . . .

And you can [illegible] full-color Kodachrome Prints at small cost [illegible] . . . show them [illegible] smaller sizes. [illegible] when you show them to your friends.

Here's a guarantee that's yours [illegible] full-color pictures with Kodachrome Film . . .

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The soaring, color-stained monuments of Zion present one of America's most inspiring scenic spectacles.

Go "Union Pacific" for smooth-riding, relaxing travel. Smartly appointed, air conditioned Pullmans and coaches provide the many comforts and conveniences of modern rail transportation preferred by seasoned travelers.

Mail coupon for free booklet describing Zion National Park.

Free booklets also are available for—

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I am interested in a Nourlip to the following region.
Please send booklet

Name region

Name

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City

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3 BIG VALUES IN

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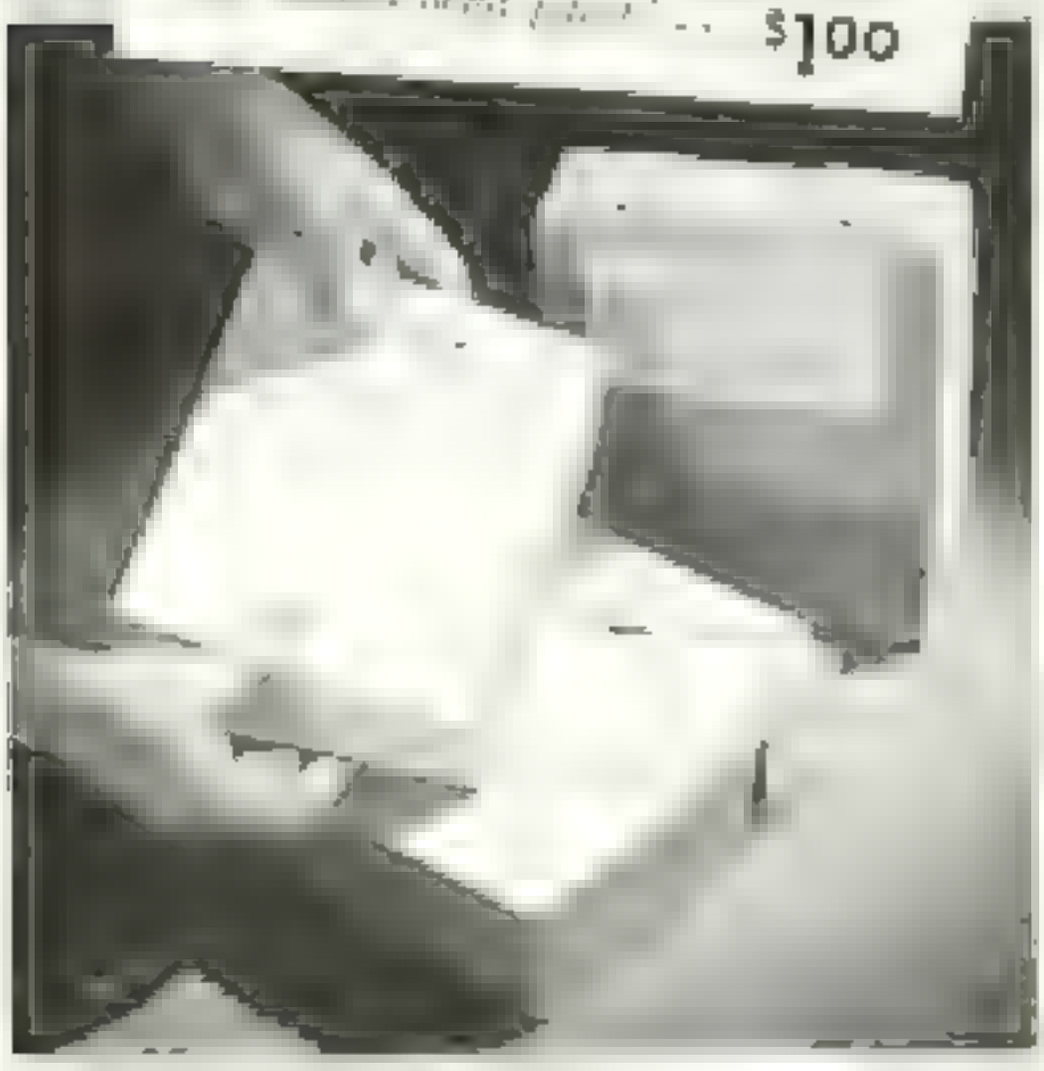

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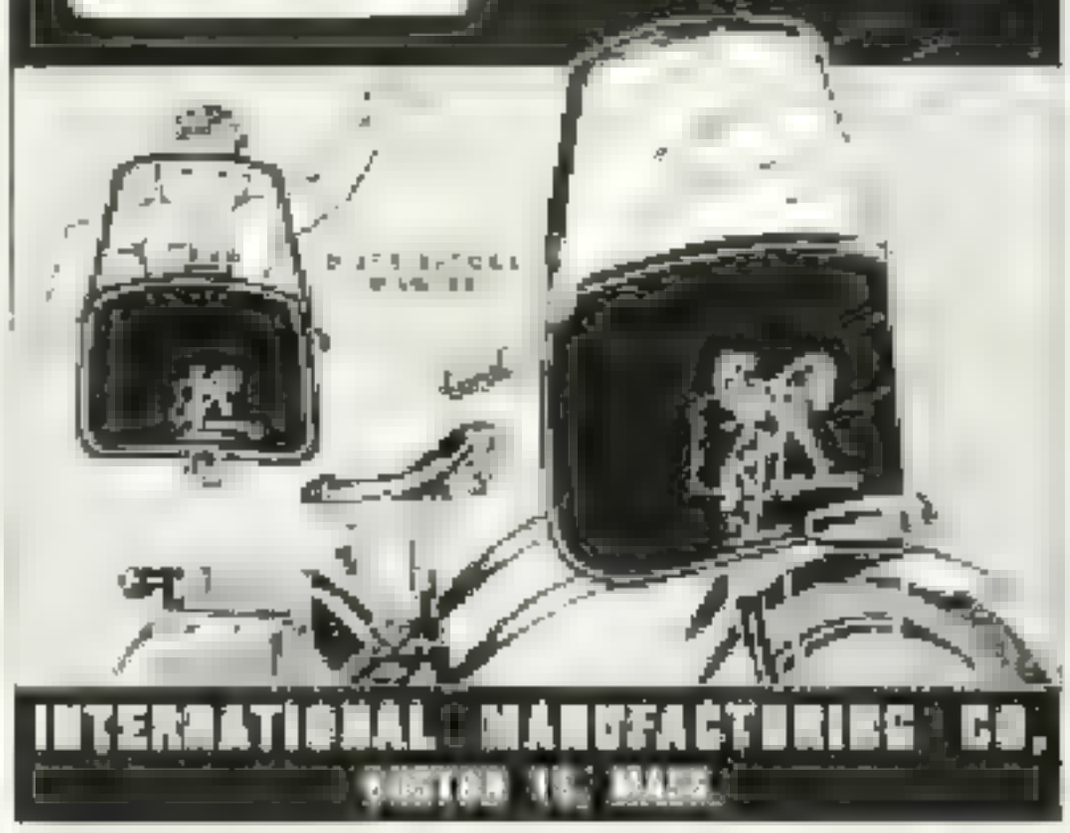

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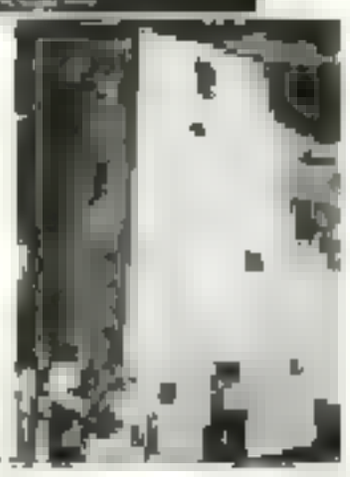

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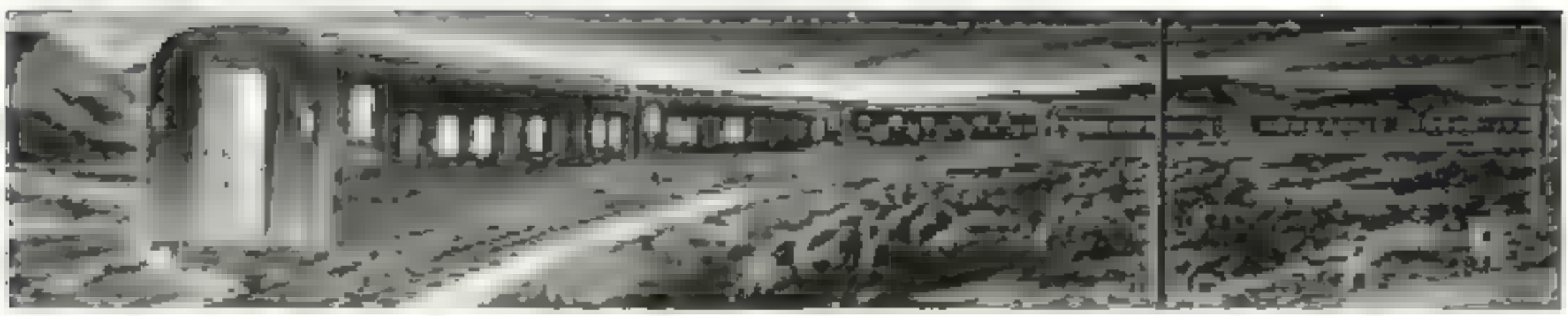

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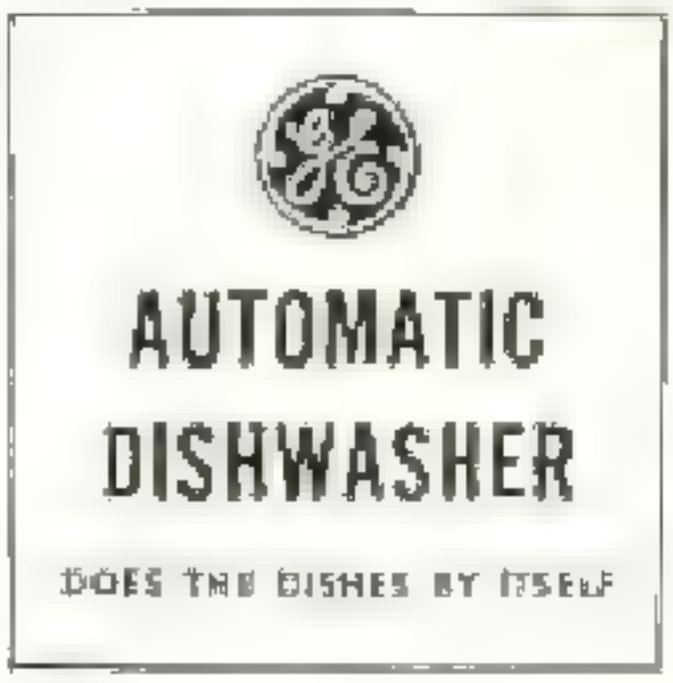

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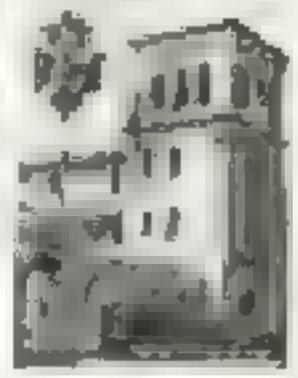

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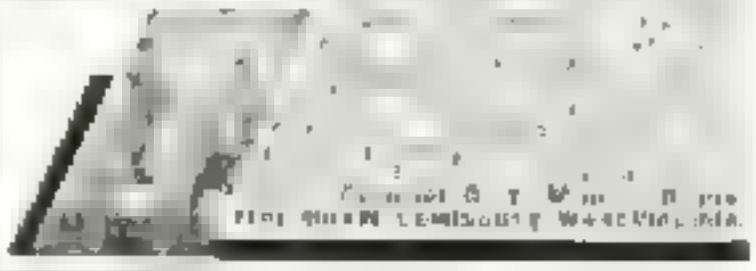

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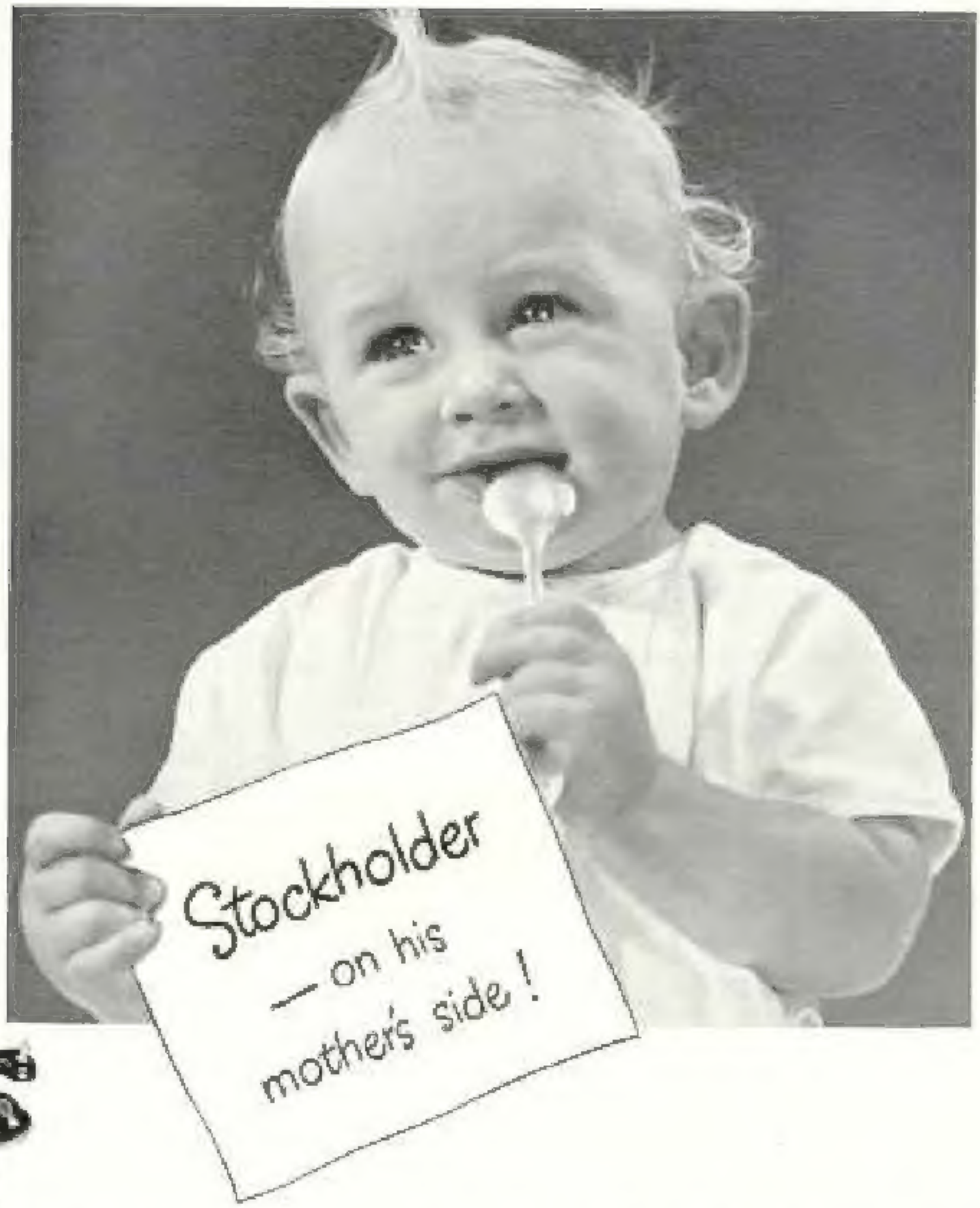

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